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SPECIAL CONSULAR REPORTS.

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CREAMERIES

IN

FOREIGN COUNTRIES.

VOL. XXIV.

REPORTS FROM THE CONSULS OF THE UNITED STATES IN ANSWER
TO INSTRUCTIONS FROM THE DEPARTMENT OF STATE.

Issued from the Bureau of Foreign Commerce,
Department of State.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1902.

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CREAMERIES IN FOREIGN COUNTRIES.

DEPARTMENT CIRCULAR.

DEPARTMENT OF STATE,
Washington, April 11, 1902.

GENTLEMEN: The Department has received a request from a Minneapolis company for information in regard to creameries in foreign countries. You are therefore directed to investigate and report on the following points:

1. Number of creameries, cooperative and other, in your district.
2. Approximate output and consumption.
3. Prospects for new enterprises in this line.
4. Encouragement, if any, given the industry by the government.
5. Duty on dairy machinery; prevailing prices; if imported, from what source.
6. Any information that may enable United States manufacturers to decide upon the proper points at which to open agencies for the distribution, or, possibly, to establish plants for the manufacture of, creamery machinery in foreign countries.

Your replies will be printed in the Consular Reports.

I am, gentlemen, your obedient servant,

HERBERT H. D. PEIRCE,
Third Assistant Secretary

To the CONSULAR OFFICERS OF THE UNITED STATES.

EUROPE.

AUSTRIA-HUNGARY.

CREAMERIES AND OUTPUT.

There are 774 creameries, cooperative and other, in this district, viz: Bukovina, 1; Galicia, 20; Carinthia, 8; Lower Austria (mostly where milk is collected), 130; Upper Austria, 7; Salzburg, 1; Styria, 5; Tyrol, 504; Vorarlberg, 98.

Of the foregoing, the power in use is:

Bukovina and Galicia, hand.

Carinthia: Five dairies, steam; 2 cheese factories—1 steam heating, the other not stated.

Lower Austria: Two creameries, steam; 24 places where milk is collected; the others sell milk in its natural state.

Upper Austria: One butter export society, electrical power; 6 cooperative societies, places for selling butter.

Salzburg: Cheese making.

Styria: Four cooperative societies, hand power; 1 dairy, steam power.

Tyrol: Gruyère cheese-making creameries, 504; primitive, cold water, Schwartz, and centrifugal systems.

Vorarlberg: Cooperative creameries: One, water power; 8, electrical power; 89, hand power.

About 500,000 liters (528,350 quarts) of milk are sold and consumed daily in the city of Vienna. No record has hitherto been kept of the products of the creameries, etc. There are now in course of compilation for the first time statistics showing the output for Austria, and these will be printed and obtainable in about a month.

PROSPECTS FOR NEW ENTERPRISES.

In order to utilize the skimmed milk for fattening swine, a number of creameries are projected in country districts, since taking this product out of Vienna again entails too much trouble and expense. For this purpose, instructors will be appointed to superintend the creameries that are to be established in rural neighborhoods, for which new machines will be needed, and American appliances have a chance if the trade is looked after properly.

GOVERNMENT ENCOURAGEMENT.

A subvention is given by the Government from time to time to the cooperative creameries. It is given according to necessity. For instance, when new plants are to be established, new buildings to be erected, and the like. Loans without interest are also made when advisable.

DUTY ON DAIRY MACHINERY.

Dairy machinery is not enumerated in the tariff, but machinery not otherwise provided for comes under the following headings:

Cooling apparatus, 10 florins in gold, or $4.704, for 220 pounds.

Machines and apparatus of wood—i. e., with 75 per cent of wood and more—5 florins in gold, or $2.352, for 220 pounds.

Machines and apparatus of base metals—i. e., with more than 50 per cent of base metals—15 florins in gold, or $7.056, for 220 pounds.

Other machines and apparatus not otherwise provided for, 8.50 florins in gold, or $3.998, for 220 pounds.

IMPORTS.

Separators are imported from two factories in Sweden and one in Belgium. A Swedish company has branch factories at Vienna, Prague, and Budapest, where creamery machinery, with the exception of separators, is manufactured. Plants for manufacturing separators would necessarily have to be well fitted up at large expense, hence the separators are purchased from the home factories.

DISTRIBUTING POINTS.

The cities mentioned above, adding Innsbruck, would presumably be the best points where agencies or plants might be established and from where distribution could be made. On account of prevailing competition and for other obvious reasons a manufacturer could not know what would be best to do in regard to opening a new business until he had made an expert investigation covering the whole field.

Alvesto S. Hogue,
Vice and Deputy Consul-General.

Vienna, *May 30, 1902.*

BOHEMIA.

CREAMERIES.

At present, there are in Bohemia about 180 creameries of various sizes in operation, and as many others are in course of promotion their number may be considerably increased within two or three years.

OUTPUT.

The output of dairy products in the existing creameries is estimated at a valuation of 150,000,000 crowns per year, equal to $30,450,000. The dairy business in Bohemia being in its infancy, it may be safely assumed that it will be largely increased in the future.

GOVERNMENT ENCOURAGEMENT.

In the way of encouragement the provincial and Imperial Governments employ traveling instructors and consulting experts. Some subsidies are also granted by the Government to new concerns.

IMPORTS AND PRICES.

Creamery machinery is almost exclusively imported from Germany and Denmark. The home manufacture is quite insignificant. The Alfa Separator Company, Limited, of Vienna and Budapest, supplies this machinery and sundry articles connected with the business.

Milk cans are largely made by the firm of Kleiner & Fleischmann, in Mödling, near Vienna, and some dairy apparatus is made by the firm of Hübner & Opitz, in Pardubitz, Bohemia. The demand in this machinery will be chiefly for the smaller apparatus for creameries, with a daily output of 1,320 to 1,585 gallons, as they are more frequently established in this country.

OPENING FOR AMERICAN MACHINERY.

I should consider this city or its neighborhood the proper place to open an agency for the sale of American machinery of this kind, or to establish a plant for the manufacture of the same, and I see no reason why the venture should not prove successful if properly conducted.

ETHELBERT WATTS, *Consul.*

PRAGUE, *June 3, 1902.*

NORTHERN BOHEMIA.

CREAMERIES AND OUTPUT.

There are 17 creameries in this consular district. It is impossible to obtain statistics of output or of consumption. It can only be said that the local creameries are unable to cover the demand, which is evident from the considerable import of butter into the district—an indication that there is room here for more creameries.

GOVERNMENT ENCOURAGEMENT.

The creamery industry receives no Government aid of any kind.

PRICE.

The price of hand machinery ranges from 200 to 1,000 crowns ($40.60 to $203), while the large power machines cost from 1,400 to 2,000 crowns ($284.20 to $406).

MACHINERY IN USE.

The large dairy machinery used in this section is almost entirely imported from Sweden. Occasionally a machine from Germany is seen, but the Swedish apparatus is considered the best made anywhere.

A Vienna factory produces a variety of dairy machinery and appliances, of which there is considerable use in this district.

Frank W. Mahin, *Consul.*

Reichenberg, *July 7, 1902.*

TRIESTE.

CREAMERIES AND OUTPUT.

Creameries may be said to be still in their infancy in this consular district, which consists of the provinces of Carinthia, Carniola, Litorale, and Dalmatia.

In Dalmatia, the extreme southern province of the empire, farms in our sense of the word do not exist. The country is sterile, and cattle are scarce. The use of butter is practically unknown, and for his scant supply of milk for coffee the Dalmatian relies on the family goat, which is here indeed the "poor man's cow." In the other provinces of this district, however, cows are more numerous than goats, and modern methods of manufacturing butter and cheese are gradually spreading. The following table gives the number of dairy societies and members thereof in Carinthia, Carniola, and Litorale for the year 1901, as well as the value of their plants:

Provinces.	Number of societies.	Number of members.	Value of plants.
Carinthia	8	305	$30,450
Carniola	40	2,720	32,480
Litorale	55	1,725	11,627
Total	103	4,750	74,557

The total quantity of milk furnished to these societies during the year 1901, and the total value of butter manufactured therefrom. was as follows:

Provinces.	Quantity received.	Value of butter produced.
	Liters.[a]	
Carinthia	607,700	$12,382
Carniola	4,596,115	168,986
Litorale	2,606,562	50,858
Total	7,810,377	232,226

[a] Liter=1.0567 quarts.

Statistical data relating to the consumption of dairy products in this consular district are not obtainable. It is, however, the opinion of experienced dealers in such products that the demand is, upon the whole, equal to the supply.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for new enterprises in this line are good. It is not likely that the number of cows will or can be greatly increased, but the creamery system will probably continue to grow at the expense of the farm dairy, until the latter will have ceased to exist.

GOVERNMENT ENCOURAGEMENT.

To the creamery industry, as to many other industries in the empire, encouragement is given by the Government. A parliamentary appropriation is made for this purpose, and the determination of the amount of the Government's contribution for the establishment of a new creamery is left largely to the discretion of the minister of agriculture. In fixing this amount, the minister is expected to take into consideration the necessity and demand for such an establishment, the number of prospective patrons or members, and the approximate quantity of milk to be worked up.

MACHINERY IN USE.

Dairy machinery is imported principally from Germany. It is, however, also manufactured in Austria, and a Viennese firm (Anton Pfanhauser) appears to be doing an extensive business in this line.

PRICES OF MACHINERY.

Separators are coming more and more into use in this country. A small hand machine separating 40 liters (42 quarts) an hour can be had for about $30. Quotations range from this up to $170, which is the price for a hand machine separating 500 liters (528 quarts) an hour. A small power separator, with a capacity of 300 liters (317 quarts) per hour, costs $110, and larger machines of this kind cost from 24 to 35 cents per liter (1.056 quarts) capacity. Complete cooling apparatuses range from $28 to $100 in price.

By far the large majority of the churns used are of the hand variety. A small churn holding 20 liters (21 quarts) can be bought for $10, and one holding 200 liters (211 quarts) for about $28. Turbine churns, operated by steam power and having a capacity of 300 liters (317 quarts), are quoted at $165. Cheese presses range in price from $5 to $60.

OUTLOOK FOR AMERICAN MACHINERY.

American creamery machinery will find a ready market in this consular district, if it can compete in price with the homemade article. The creamery industry will continue to grow here in popularity, and steam power machinery will more and more take the place of hand machines. I am therefore inclined to believe that if an American agency with an assorted stock of creamery appliances were established at Trieste, which is the center of distribution for southern Austria, a large business could be done. The agency should, if possible, be managed by an American familiar with the language and customs of the people, and all catalogues and circulars intended for use in this region should be printed in the German and Italian languages.

For some years to come, however, the present demand for machines worked by hand will doubtless continue, and American hand machines put on the Austrian market at reasonable prices would in all probability find a ready sale.

It is my opinion that the establishment in this consular district of a plant for the manufacture of creamery machinery would prove a failure, the local consumption being too insignificant to support such an enterprise.

FREDERICK W. HOSSFELD, *Consul.*

TRIESTE, *July 31, 1902.*

BELGIUM.

ANTWERP.

OUTPUT AND CONSUMPTION.

The creamery industry in this consular district is of little importance and almost entirely in the hands of the farmers, there being but three creameries established on anything like a commercial scale. There are no statistics showing how many other creameries exist, but whatever their number may be, they are merely the enterprises of farmers who either bring milk, cream, butter, and cheese to be sold to house-to-house customers or at the Antwerp markets.

The latest industrial statistics (published in 1898), however, show that on December 31, 1897, there existed in the province of Antwerp 10 cooperative creameries, run by 430 members, owning 1,760 cows. These establishments sold, in 1897, as follows: Milk, $18,960; butter, $80,049; skimmed milk, $709. For cream and cheese, there are no statistics to be found. A few of the creameries before referred to have depots in the cities where they sell their butter, which is of excellent quality, surpassing that of all the imported products save that which comes from Denmark; the latter, however, is imported in very small quantities.

In 1901, 7,833,241 pounds of fresh and salted butter were imported into this country; in 1900, 8,013,074 pounds; in 1899, 8,238,960 pounds. The respective amounts were valued at $1,967,200, $2,012,400, and $1,934,600, of which 66⅔ per cent were from Holland and the balance from France, Germany, Austria, the Grand Duchy of Luxemburg, and Denmark.

In the three years above mentioned, Belgium exported, respectively, 5,926,860 pounds, 5,778,837 pounds, and 6,764,699 pounds of fresh and salted butter, the amount being valued at $1,488,400, $1,451,200, and $1,588,400, 95 per cent of which went to France and the balance to Holland.

IMPORTS AND PRICES OF MACHINERY.

The dairy appliances mostly in demand in this country are known as centrifugal machines and are employed by all the principal farmers as well as by the cooperative creameries. A few of the machines used in Belgium are manufactured at Thildonck and Wespelaer, in Belgium, but the greater part is imported from the United States, England, Germany, Denmark, and Sweden; Stockholm having a world-wide reputation for this special line of goods.

With regard to prevailing prices, no dairy machinery is manufactured in this consular district, and the only importer of same here issues no price list and is not inclined to give the required information. Mr. George W. Sillcox, an American importer of Brussels, however, gives me the following prices of German hand separators and American hand churns on the Brussels market, viz:

Hanoverian separators.

No.	Quarts per hour.	Price.	Letter.	Quarts per hour.	Price.
0	105	$57.90	A	95	$50.18
1	158	61.76	B	142	59.83
2	232	82.02	C	185	68.52
3	285	91.52	D	243	77.20
4	370	122.56			

American churns.

No.	Quarts per hour.	Price.	No.	Quarts per hour.	Price.
0	19	$3.00	4	37	$6.37
1	27	3.47	5	75	6.95
2	37	4.05	6	105	9.16
3	19	5.79	7	142	10.61

The nearest port to which machinery would have to be shipped for destination named is Antwerp, to which regular lines of steamers run from Boston, New York, Philadelphia, Baltimore, and New Orleans.

PROSPECTS FOR NEW ENTERPRISES.

With regard to the prospects for new enterprises in this line, it may be said that the people seem to prefer to buy direct from the farmers who deliver their products themselves, coming from the outlying districts in the early hours of the morning and finishing their rounds by 8 a. m. or, as in some cases, delivering late in the afternoon instead of the morning. There is, however, a great want of supply to meet any cases of emergency, and a creamery established on a large scale and with modern appliances would certainly fill a long-felt need, though opposition would be met with on the part of the farmers, and it is doubtful if the latter would lend any assistance. The people in this part of Belgium are excessively slow in supporting anything that tends toward a change in their customs, and this prejudice protects many old-fashioned trades that would long since have been absorbed by up-to-date industries, had the people sufficient inclination for progress.

After taking into consideration the above-mentioned obstacles, the fact remains that the industry referred to could be largely improved and extended, inasmuch as it exists at present in a most primitive state. Milk is not brought to the cities in milk trains or special vans, as is the case in the United States, but is still conveyed by the individual farmer, who makes the daily rounds as above explained. There is no doubt that when once accepted by the population of the cities, a modern creamery in this district would become a well-paying investment. In this connection, it may be said that the lack of development of the industry under consideration, as far as the consular district of Antwerp is concerned, is due to the fact that the cows are stall-fed, owing to every available acre of ground being under cultivation and to a consequent lack of grazing land. The provinces where the industry is of far greater importance are Limburg and Luxemburg, there being 56 cooperative creameries in the former province and 50 in the latter, possessing in all, in 1897, 31,556 cows, owned by 12,236 farmers.

It would seem, therefore, that our manufacturers of dairy machinery would do better to begin by opening agencies or establishing plants for the manufacture of creamery machinery in the two centers above mentioned rather than in any other part of the country.

GEO. F. LINCOLN, *Consul-General.*

ANTWERP, *May 20, 1902.*

BRUSSELS.

CREAMERIES.

There are 75 cooperative and other creameries now in operation in this consular district, distributed as follows:

Province.	Creameries.	Number of members.	Number of cows.
Brabant	34	1,785	6,253
Hainaut	29	2,280	7,140
Namur	12	1,540	3,390

OUTPUT AND CONSUMPTION.

The total value of output of creameries in this consular district for the year ending December 31, 1900, was 6,046,544 francs ($1,166,982.99), as follows:

Province.	Milk.	Butter.	Other product from skim milk.	Cheese.
Brabant	$8,839.40	$388,043.87	$12,226.55	$227.35
Hainaut	681.29	648,616.84	5,209.07	880.08
Namur	....	99,831.18	979.86	1,447.50
Total	9,520.69	1,136,491.89	18,415.48	2,554.93

No statistics are kept by the authorities showing consumption of the above named domestic products in Belgium.

OUTLOOK FOR AMERICAN MACHINERY.

Mr. George W. Sillcox, an American, of No. 73 Rue de Laeken, engaged for more than twenty-five years in this city in introducing and selling American machinery, agricultural implements, tools, and machinery for creameries; Mr. G. Duchamps, No. 47 Rue du Choeur, dealing in agricultural implements, creamery and other machinery, and Messrs. E. Godefrioid & Co., 316 Avenue Van Volxem, also of Brussels, and dealing specially in machinery and supplies for creameries, inform me that this country offers a splendid field for American creamery machinery and supplies, such as hand and motor machines, churns, separators, skimmers, boilers, pug mills, kettles, cream refrigerators, blenders, spiral-roller butter tables, etc.

At a recent exhibition of bovine stud animals, creamery products, machinery, and supplies for creameries, held in this city, my attention was attracted to the extensive display of improved appliances and machinery for creameries, the greater portion of which was of German and English origin. In view of the constantly increasing use of machinery in creameries in this country, I see no reason why our manufacturers should not capture a considerable share of this market, which can be done if agencies are established at Brussels, Mons, Namur, Tirlemont, and Charleroi, the principal cities in this consular district, for the exhibition and sale of their goods.

GOVERNMENT ENCOURAGEMENT.

The Belgian Government does not give any special encouragement to this industry. Savings banks, however, advance money to cooperative creameries on mortgages.

DUTY ON CREAMERY MACHINERY.

Duty on dairy machinery is classified under the head of "Machinery, implements, and tools," as follows: Of cast iron, 2 francs ($0.386) per 100 kilos (220 pounds); of iron and steel, 4 francs ($0.772) per 100 kilos (220 pounds); of wood, 10 per cent ad valorem.

IMPORTS.

Machinery for creameries is manufactured in small quantities at Thildonck and Wespelaer, Belgium. The principal amount, however, sold on this market is imported from Germany, England, United States, Denmark, and Sweden.

Prevailing prices.

SEPARATORS.

Capacity.	Price.	Capacity.	Price.
HAND.		MOTOR.	
40 liters per hour	$30.88	400 liters per hour	$154.40
125 liters per hour	45.55	600 liters per hour	202.65
200 liters per hour	64.65	1,000 liters per hour	212.30
250 liters per hour	82.02	1,200 liters per hour	241.25
300 liters per hour	91.67	1,800 liters per hour	289.50
400 to 500 liters per hour	106.15	2,000 liters per hour	299.15

CHURNS.

HAND.		MOTOR.	
40 liters per hour	$19.30	160 liters per hour	$38.60
60 liters per hour	20.26	225 liters per hour	53.07
90 liters per hour	22.96	250 liters per hour	55.00
115 liters per hour	24.12	300 liters per hour	57.50
145 liters per hour	26.05	400 liters per hour	64.65
200 liters per hour	27.98	450 liters per hour	68.51
230 liters per hour	36.67		
320 liters per hour	43.42		

AMERICAN CHURNS (MOTOR).

75 liters per hour	$68.51	225 liters per hour	$86.85
115 liters per hour	74.30	300 liters per hour	96.50
150 liters per hour	82.02	375 liters per hour	106.15

CREAM REFRIGERATORS.

80 liters per hour	$12.54	500 liters per hour	$34.74
100 liters per hour	16.40	800 liters per hour	44.39
180 liters per hour	20.26	1,200 liters per hour	62.72
300 liters per hour	26.05	1,800 liters per hour	86.85

Pug mills.

Pug mills with spiral roller butter tables, from $13.15 to $26.63; with flat table, straight fluted roller, from $10.61 to $24.12; with rotary table, from $22.19 to $96.50.

KETTLES.

Capacity.	Price.	Capacity.	Price.
40 liters	$4.24	100 liters	$6.94
60 liters	5.21	125 liters	8.10
80 liters	6.17	150 liters	9.26

APPARATUS FOR PASTEURIZING MILK AND CREAM.

225 liters per hour	$61.76	2,025 liters per hour	$142.82
450 liters per hour	81.06	2,700 liters per hour	162.12
900 liters per hour	104.22	3,600 liters per hour	197.82
1,570 liters per hour	123.52		

MILK CANS.

15 liters	$1.73	25 liters	$2.22
20 liters	1.93	30 liters	2.53

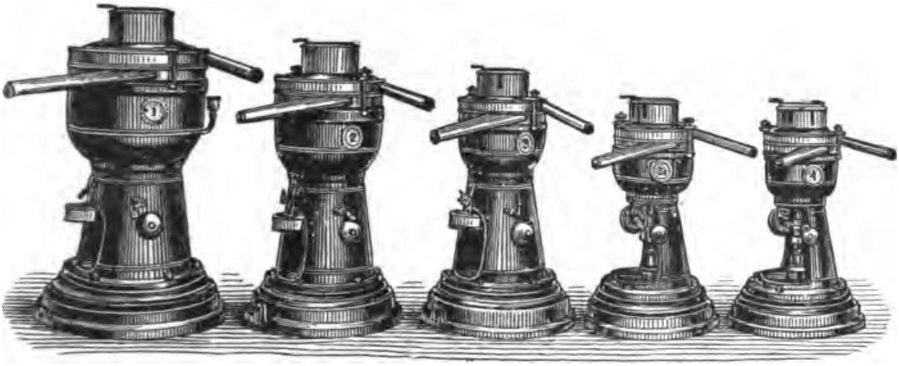
CONTROLLING MACHINE FOR THE ANALYSIS OF THE FATTY MATTER OF MILK AND ITS DERIVATIVES.

For 4 analyses at once	$15.44
For 8 analyses at once	22.43
For 16 analyses at once	25.57

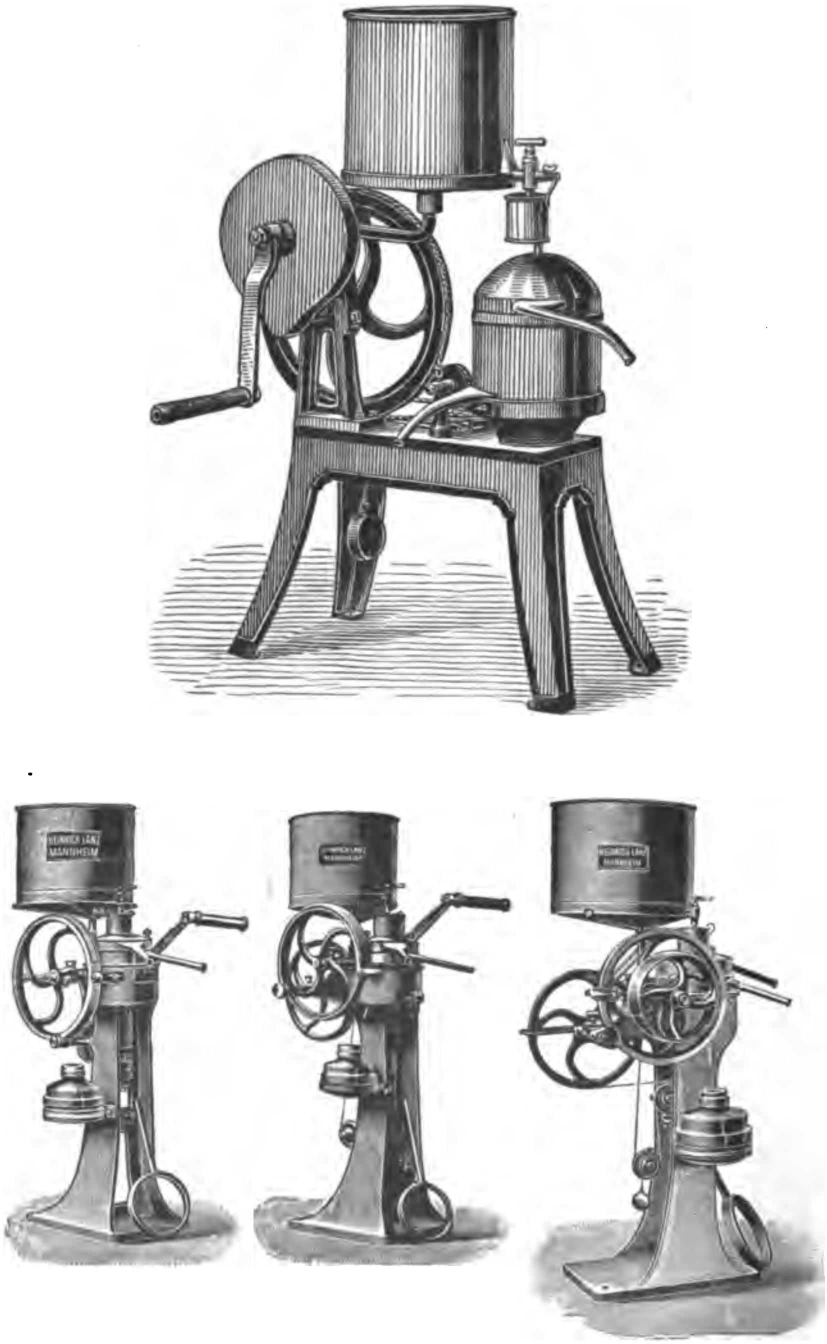
1 liter is equivalent to 1.05 quarts.

GEO. W. ROOSEVELT, *Consul.*

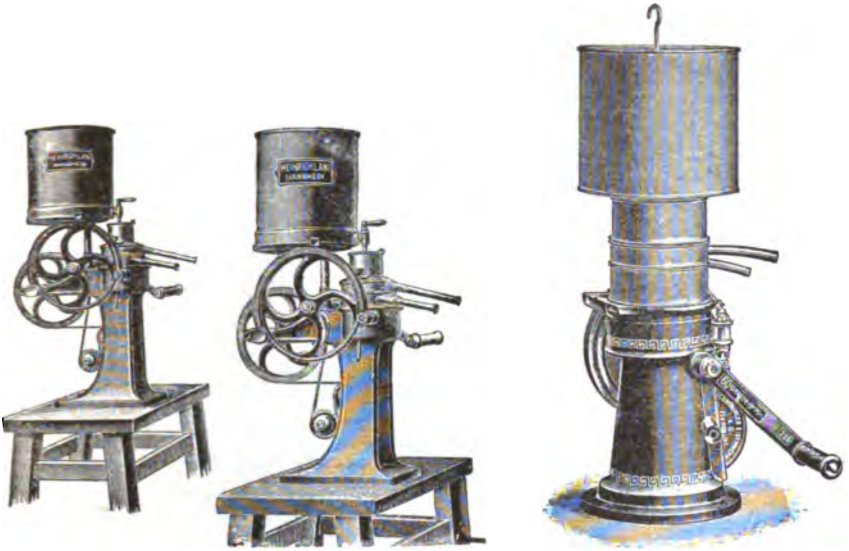
BRUSSELS, *May 14, 1902.*



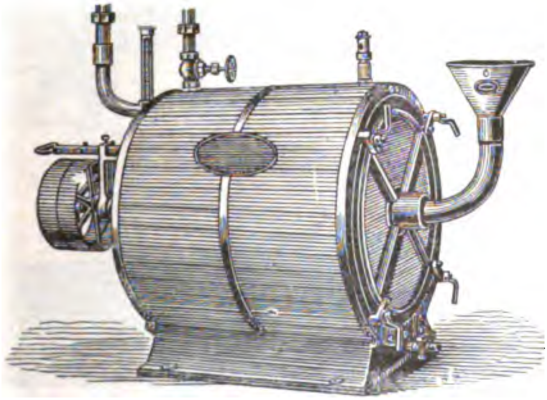
Separators (skimmers).



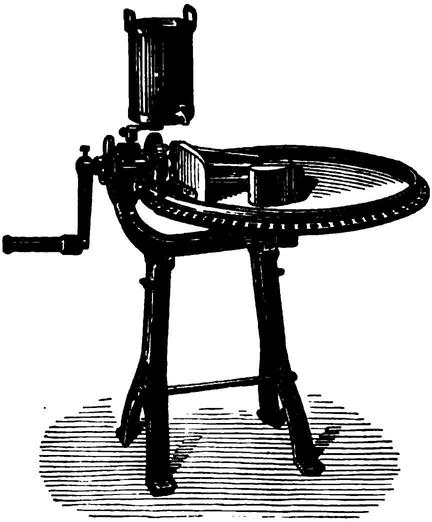
Separators (skimmers).

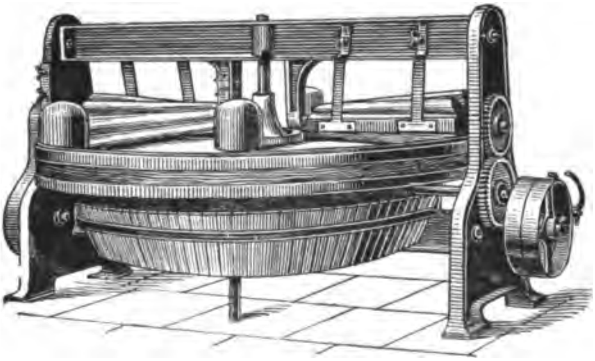


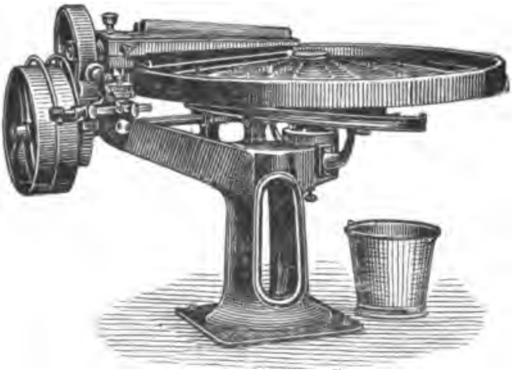
Separators (skimmers)



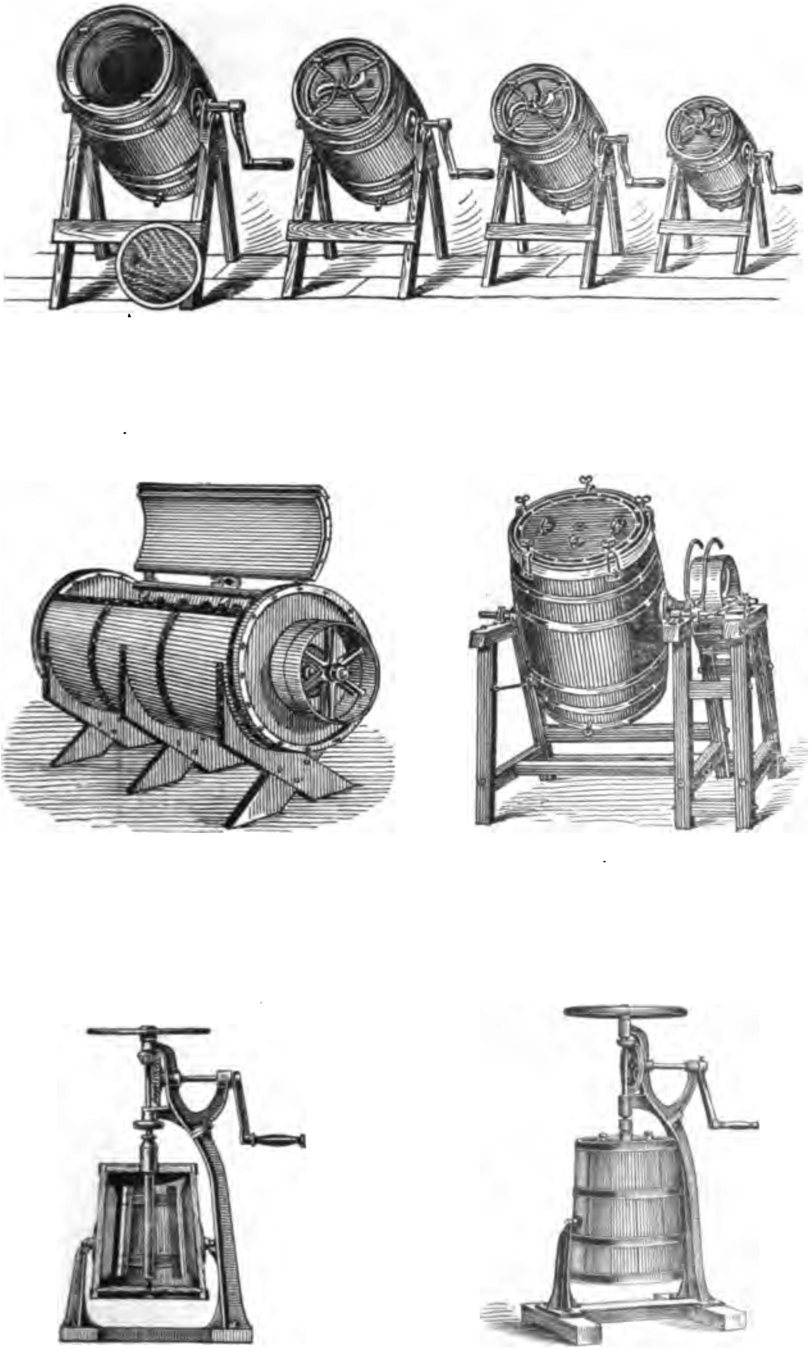
Apparatus for pasteurizing milk and cream.



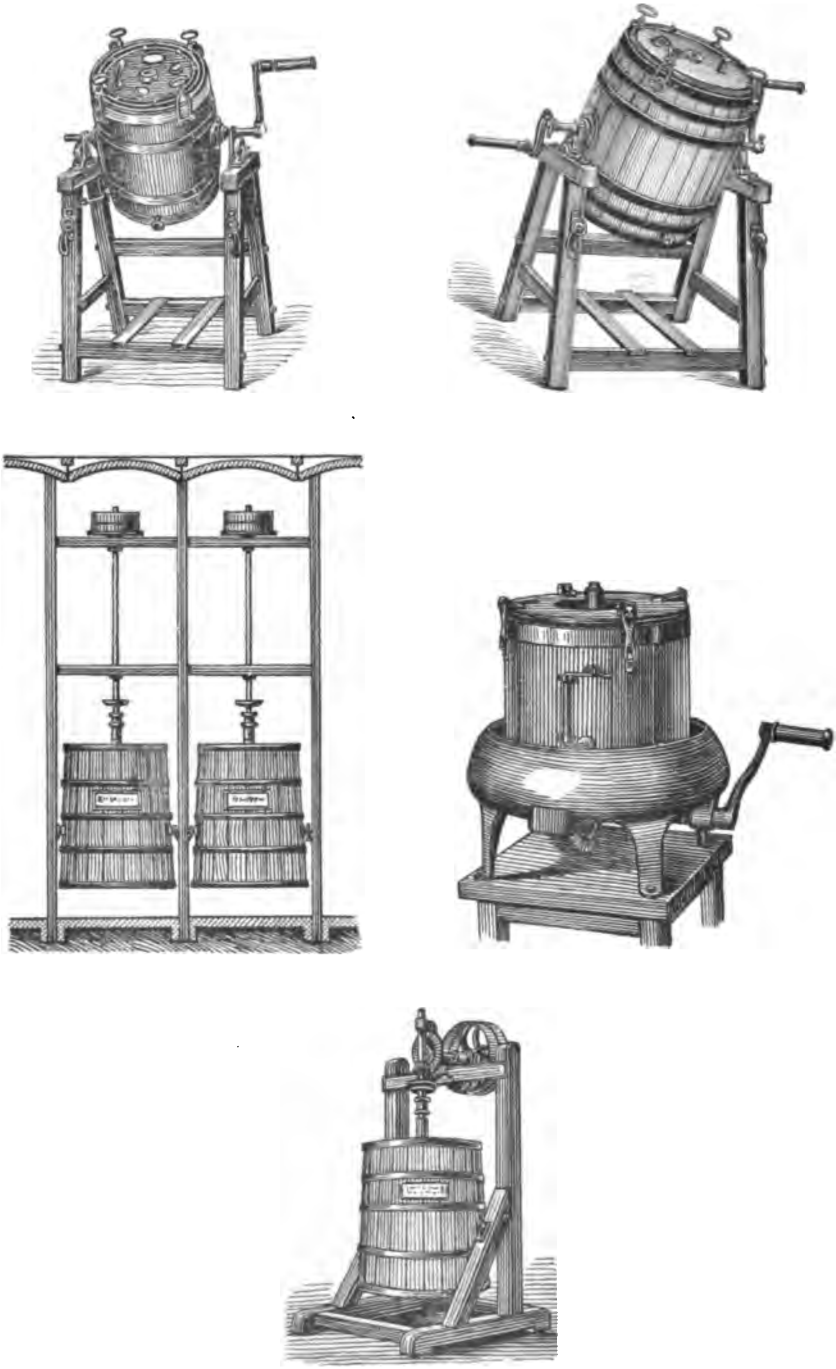




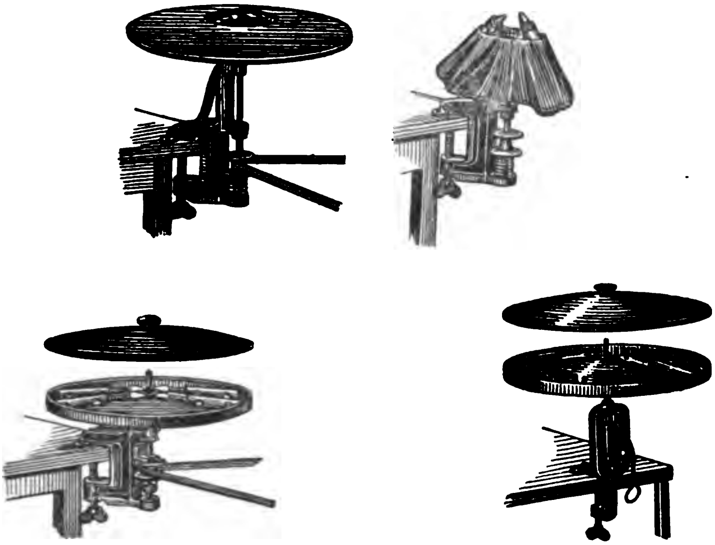
Pug mills.



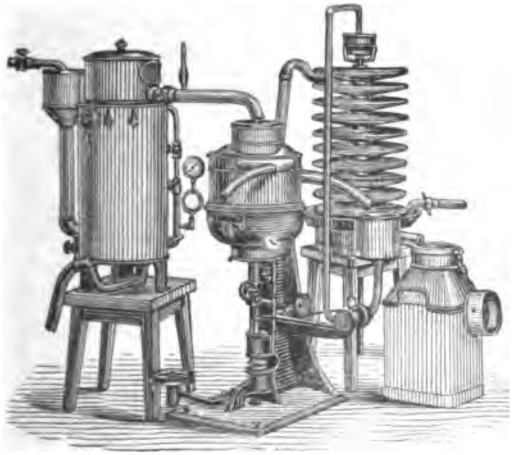
Churns.



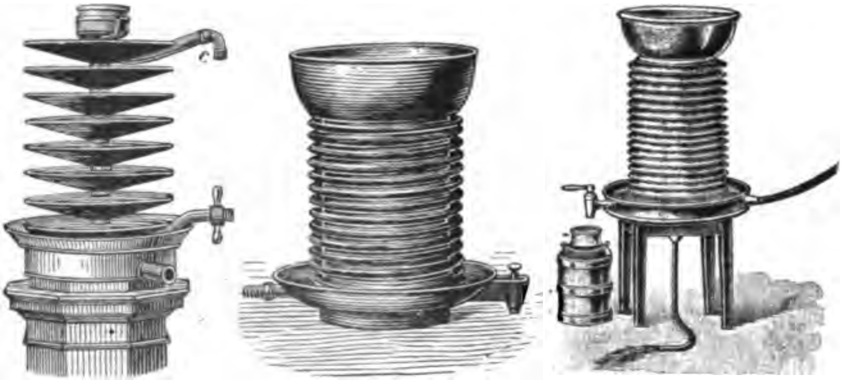
Churns



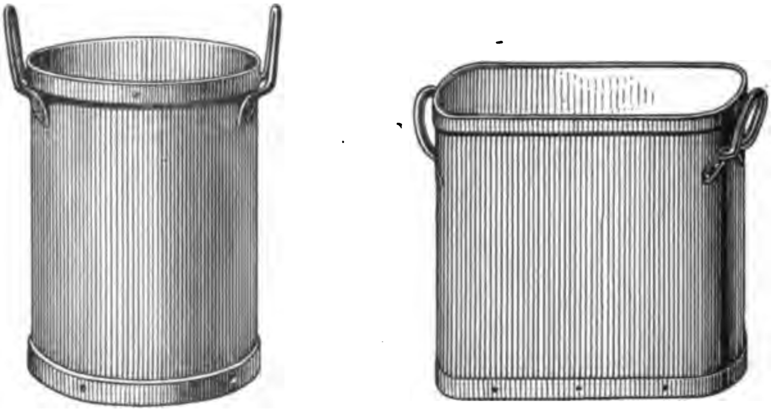
Controlling Machines for analysis of milk, etc.



Cream Refrigerators.



Cream Refrigerators.



Reservoirs for cream

Milk Cans.

Kettle.

EAST AND WEST FLANDERS.

CREAMERIES AND OUTPUT.

In East and West Flanders, which compose this consular district, there are about 120 creameries, besides a great number of small ones. Most of them are cooperative, only about 20 being industrial; the latter are slowly disappearing, as they do not offer sufficient guaranties to farmers. Of the 120, about 30 are run by steam, the others by hand. The large creameries take milk from large areas, which makes it very inconvenient for farmers who live some distance away. Other reasons which are considered detrimental to the development of creameries worked by steam are a suspicion on the part of the farmers and communal and political rivalry. It is, however, anticipated that the Government will soon require farmers to have their milk sterilized, which will eventually do away with the greater number of small creameries.

It is impossible to state, even approximately, the output and consumption, as I am informed that statistics do not exist. The greater part of the product is shipped to the industrial part of the country, principally to the province of Hainaut. Most of the export product goes to France and Holland.

GOVERNMENT ENCOURAGEMENT.

The Government encourages this industry by the organization of creamery schools for boys (at Borsbeke), where employees for creameries are educated. Temporary schools are established from time to time for the instruction of girls who have charge of the milk and cows on farms. Lectures are given on the new systems of skimming and churning, and the advantages and economies of cooperative creameries. The Government has also organized, at its expense, a service of creamery counselors and inspectors, who are requested to furnish all needed information and watch the manufacture while it is going on. Twice a year they inspect the creameries from a technical and commercial point of view, but principally verify the bookkeeping. When the industry was first started, the Government granted small subsidies for installation expenses, and sent experienced creamery women to work in the new plants for a few weeks.

IMPORTS OF MACHINERY.

The principal dealers who import machinery for creameries inform me that at present, owing to the adjustment of the entire business, there is no demand for new machines. Most of the machinery is imported from Norway or Denmark. Churns are imported from England and Germany. Centrifugal machines are not much used.

The firms, all in Ghent, that would be principally interested in the introduction of dairy machinery are: Dutry-Colson, Rue des Champs; O. De Koker De Gouys, Rue des Champs; Heynssens & Co., Rue Haut Port; Em. De Noyel & Co., Rue St. Georges.

FRANK R. MOWRER, *Consul.*

GHENT, *June 14, 1902.*

LIEGE.

CREAMERIES AND OUTPUT.

The dairy interests of Belgium are quite extensive, but fall considerably short of supplying the demand. In 1900, the imports amounted to $4,359,360.80 and the exports to $1,476,662.20, of which cheese constituted $2,347,038.40 of the imports and $17,425.20 of the exports. During the same time, the 356 creameries of Belgium, with 40,706 farmers, contributing milk from 104,987 cows, sold $4,101,383.40 worth of butter and $4,987.40 worth of cheese.

The average amount of butter consumed per inhabitant each year in Belgium is 25 pounds, which averages in price from 25 to 27 cents per pound.

The dairy interests of this consular district, consisting of the provinces of Liege, Limburg, and Luxemburg, are about equal to the other six provinces of the Kingdom. There were in 1900 in these provinces 203 creameries, with 29,545 farmers, contributing milk from 58,515 cows, which sold $1,831,763 worth of butter and $2,339.50 worth of cheese, after supplying the needs of the members of the associations.

Of the 203 creameries, 187 are cooperative and in general were organized by the priests of the different parishes. Many of them are still under their supervision. At first, the priest called on the members of his congregation to make known from how many cows each would furnish milk. If enough could be secured, arrangements were made for the necessary building and machinery. In many cases the site, and often the building, was donated by some member of the community. Only the help actually employed in making the butter is paid as a general rule, the officers and directors getting no pay

GOVERNMENT ASSISTANCE.

The principal assistance given this industry by the Government is by way of free lectures and advice by expert agriculturists, who instruct normal classes for three months at a time in different parishes or give advice to individuals when requested. These have done much toward developing the dairy interests of Belgium. The Government also gives special railroad rates for dairy products, and during the summer provides for their transportation on fast trains.

MACHINES AND PRICES.

The retail prices of centrifugal creamers are quoted by a retail firm of this city as follows: Twenty-two gallons of milk per hour, $38.60; 44 gallons, $58.87; 66 gallons, $82.03—all hand power. American steel barrel churn, holding 15.4 gallons, $12.35; 44-gallon oak barrel churn, $30.88. Hand butter worker with table, 2.9 feet in diameter, $38.60; without stand, 3.3 feet, $35.64. All with 2 per cent off for cash.

Much of the dairy machinery used here is manufactured in Belgium, and it is well up to date. However, some is imported from France, Germany, and Denmark, and a little from the United States, which seems to be rapidly increasing in the line of churns and butter workers.

ALFRED A. WINSLOW, *Consul.*

LIEGE, *June 16, 1902.*

DENMARK.

My report on "Agricultural cooperative societies in Denmark," published in Advance Sheets Consular Reports, No. 1253, January 31, 1902, answers every question asked in creamery circular except No. 5, as to the duty on dairy machinery.

DUTY ON MACHINERY.

The duty on this sort of machinery is 33⅓ öre per Danish pound, which equals 8 cents per American pound. The Danes manufacture and export this sort of machinery, besides supplying the home demand. The customs officers report that there has been none imported for the past twelve years.

J. C. FREEMAN, *Consul.*

COPENHAGEN, *June 13, 1902.*

AGRICULTURAL COOPERATIVE SOCIETIES IN DENMARK.

[Republished from Advance Sheets No. 1253, January 31, 1902.]

ANCIENT AND MODERN COOPERATION.

The principle of cooperation, as manifested in the common ownership of the soil and the common care of the cattle, is prehistoric in Denmark. While this sort of cooperation naturally ceased with the great agricultural reforms at the end of the eighteenth century, a new sort of partnership has taken form in the course of time, and many associations have come into being whose aim is, through mutual help in purchase and production, to obtain the greatest possible profit for the producer. Partnerships of the latter description have had a rapid development during the last decades, a development illustrated by the method of handling the milk and the marketing of the cattle and swine. As regards the cooperative swine associations, it is worth noticing that, by means of cooperative marketing, the money realized is distributed directly among the producers themselves.

COOPERATIVE DAIRIES.

The cooperative dairies are associations from which each member receives a dividend proportionate to the quantity of milk he has delivered. The first Danish cooperative dairy was put in operation in Jutland in 1882. There are now 1,032 of these dairies, converting about 1,800,000,000 kilograms (3,968,280,000 pounds) of milk into $35,500,000 worth of butter.

The dairies were erected and put into operation at a first cost of $7,000,000, the initial cost of each dairy varying from $2,000 to $10,000. The number of shareholders is about 150,000, an average of 146 for each dairy. The number of cows yielding the necessary milk is 858,000, each dairy receiving, on the average, milk from 832 cows. The aggregate production of butter in the cooperative dairies alone amounts to 130,000,000 pounds per annum.

The advantages of the cooperative dairies are evident. They have made it possible for the whole community of small farmers to produce butter of a first-rate and uniform quality, up to the standard required for export. They are, moreover, enabled to produce a greater quantity of butter from a given quantity of milk. There has been a stricter control of the productive efficiency of each animal, a strenuous effort for the improvement of the latter by better feeding, and a further improvement of the qualities of the soil.

The increased production of high-grade butter, resulting from the continual development of the cooperative dairies, is indicated by the surplus exported, which advanced from 19,000,000 pounds in 1879–80 to 153,000,000 pounds in 1900.

While the manor farms, owned by the wealthy proprietors, have for a long time produced butter of a high grade, which sold at high prices, it is only since the establishment of the cooperative dairies that the small farmers have been able to enjoy similar returns for their product. As more than three-fourths of the milk-producing stock is to be found on the small farms, the importance of these better prices to the country as a whole is obvious.

The employment of strong food has also increased. The import of bran and oil cake for this purpose, which was valued at 5,000,000 to 6,000,000 kroner ($1,340,000 to $1,608,000) in the eighties, now amounts to 40,000,000 kroner ($10,720,000) a year. The bulk of this import comes from the United States.

Each separate dairy is under the management of a farmer or tenant. These vie with each other in the excellence of their product. The efficiency of the dairies has been greatly enhanced by the work of competent dairy experts or counselors paid by the Government, who are always ready to go where their services are required to correct mistakes and remedy deficiencies in the manufacture.

While the cooperative dairies have been instrumental in raising the quality of the product and in bringing prosperity to the farmers, they have exercised an important influence in other provinces of agriculture, their success promoting similar associations in other departments of farm work.

BUTTER EXPORT ASSOCIATIONS.

In close connection with the cooperative dairies are the Danish Farmers' Butter Export Association of Copenhagen, and the cooperative butter factory of Esbjerg, on the west coast. In the latter the butter received daily from the dairies is packed and immediately exported to England. These two companies handled $4,000,000 worth this year.

J. C. Freeman, *Consul.*

Copenhagen, *December 23, 1901.*

FRANCE.

FRENCH V. AMERICAN DAIRY SYSTEMS AND PRODUCTS.

As a general rule, French machinery of all kinds is rather inefficient—rather lacking in that directness and adaptation to an explicit use which especially characterizes American inventions. It may be said that it lacks "handiness" and is not so carefully planned to save time and labor in operation as are American devices. It seems to me that I have observed this in trying to compare the machinery of our American dairies which I have visited and that of the French dairies which I have been permitted to examine. In the former, everything is designed to economize manual labor and reduce the force necessary for its operation; in the latter this appears to be quite neglected.

At the same, time it would be unfair to make such comparison without some consideration of the difference of aim and purpose of the two systems. The American system is especially designed to produce American butter and cheese with the least possible outlay of manual labor; the French factory system is designed to produce the greatest possible output of French butter and French cheese with the least waste of material convertible into a product which may find sale and consumption, with little regard to economy of labor. In other words, the one is intended to economize labor and the other to minimize waste. How far a system of the former character is likely to supersede one having such a different aim can only be determined by one having an expert and exhaustive knowledge of both.

The idea no doubt prevails with many of our people, that "dairying" is simply dairying the world over, and that machinery designed for the production of American butter and cheese must of necessity be of equal excellence and desirability in the production of French butter and infinitely varied styles of French cheese. This idea may be correct, but my observation has been that the contrary is true. French butter, taken as a whole, is about as far removed from the American idea of that article as is possible to conceive. It may be said to be of three grades. The first grade, usually made up in little pats or rolls, is entirely without salt and when freshly made is of good flavor. It is, however, entirely different both in color and texture from the best American article. It lacks almost entirely the solidity and granular character of prime Elgin or Chautauqua butter. At its best it is lighter in color, softer, and of a greasy or pasty consistency. It cuts with a smoothness which suggests lard rather than butter. This is due to the fact that it is churned at a higher temperature than with us, the object being not so much quality as quantity. The second grade is said by a standard French author to contain, in addition to the cream product, a certain proportion of a fatty substance resulting from a mixture of buttermilk and skimmed milk heated to about 70° C. and allowed to cool. The fatty deposit which rises to the top of this is skimmed off and mixed with a certain amount of pure cream or milk, churned, and, according to the author's idea, furnishes a butter "not in all respects equal to the first grade, but entirely wholesome," and, if too much of this "graisse" is not used, of a flavor hardly inferior to it. This, he says, is sold by the best "beurreriers" at a somewhat reduced price. A third grade, our author says, is made by heating the residue of the milk, together with the whey in cheese factories, up to 90° C., making a second skimming of the fatty product which rises, and churning the same with a small quantity of milk and cream. The result, he frankly admits, is "detestable." This is always salted and is said to be used for cooking purposes only. There is a popular belief that "margarine" is freely used in the preparation of French butter, but as the chief establishments guarantee the purity of their product and invite analysis, it is probable that the only adulteration, if it is adulteration, to be found in their product is a more or less liberal use of lacteal fats obtained by reheating the milk as described.

FRENCH BUTTER AND CHEESE OUTPUT.

France not only supplies her own people with butter, but exports it every year to the value of about 60,000,000 francs ($11,580,000). This does not mean as large a production as would be required for an equal number of Americans, since the individual consumption of butter in France is much less than with us—probably not more than one-fourth as much per capita. Butter usually appears on the French table with the radishes as a first course at the midday meal, and is not seen again in recognizable form until the next noon. Nevertheless, the cuisine à beurre is considered the richest and most delicate style of cooking, except in the southeast, where the cuisine à l'huile and garlic prevail. With the lower classes the cuisine à lard, or cooking with grease of almost any kind and plenty of it, is common. Many of this class hardly ever taste butter.

It is not so, however, with cheese. The varieties of cheese made and eaten in France are bewildering. From the "Chantilly," a half-soured cream beaten almost to butter, sometimes sweetened and flavored with vanilla, to the ripe and crumbling "Roquefort;" from the acidulous "demi-sel" to the salve-like "Camembert," cheese of some sort or other makes its appearance at almost every meal, whether the partakers be of high or low degree. This, too, the French dairymen furnish not only in abundant quantities for home consumption, and at prices adapted to the means of the poorest, but also for export to all parts of the world. The methods of manufacture are by no means uniform, but vary greatly not only with location but also with the quality of the cheese produced by different processes in various parts of the country.

In Aveyron, every mountaineer makes cheese. The herds of cattle are driven to the high mountain pasturage on the 1st of May and do not return to their village stables until the 15th of October. During the interval, each owner fabricates his cheese in a rude milk house beside some icy pool or glacial rill. The larger producers have a daily output of three or four cheeses, weighing about 100 pounds each, which are sold to buyers who attend the market fairs held in certain villages at intervals during the summer. There is almost no butter made by these mountain dairymen.

In Ain, on the contrary, the villagers form associations, transporting their milk to a certain locality where an expert is paid to work it up at so much per 100 kilos of the raw material. The butter is generally sold to retail dealers, and the cheese, Gruyère and Gex, is disposed of at wholesale.

The department of the Hautes-Alpes has a great many creameries and cheese factories, where milk is bought at a stated price, usually 10 centimes a liter or about 1½ cents a quart. The cheese chiefly in favor there is the bleu—gros bleu and petit bleu—the last named resembling Roquefort. In Cantal, there are more than 1,200 similar dairies.

Charente and Poitou also are great centers of cheese production, which has recently been brought to a perfection hitherto unknown.

In the Cote-du-Nord, the rich and extensive pastures have lately led to a revival of butter and cheese making, but the industry is not as yet centralized or well regulated.

In Ardèche it is even less so. Here every farmer makes butter and cheese according to his fancy, for the rich grassy uplands are unrivaled for grazing. But as it is said to be the habit in this region to keep the cream from a week to twenty days before churning, with very little care about its surroundings, the most primitive appliances being used, the product is not equal to that of other districts.

Around Annonay a few associated creameries have been started with the simplest apparatus.

The plateaus of Coiron and St. Agrève furnish large quantities of butter, which is exported to England, Brazil, and the Far East. Establishments for condensing milk and bottling sterilized milk for shipping supplies are also very numerous.

Perhaps the best butter in France comes from the departments of Brittany, Calvados, and Finistere. Much of this is exported in an entirely unsalted condition to Great Britain. Nearly all the butter-making establishments in these departments have connected with them cheese making, for the purpose of working up the skimmed milk into such varieties as Auvergne, Gruyère, and similar sorts, both for home consumption and export.

The butter industry has been greatly stimulated of recent years by the perfection of the parcels-post (Colis postaux) system, which takes parcels up to 6½ pounds for 85 centimes, or 16 cents; packages of 11 pounds for 20 cents, and packages over 11 pounds and under 22 pounds, 29 cents, to be delivered anywhere in France at any address. Delivery in good condition may be insured by paying 10 centimes (2 cents) additional. By this means, a 5-pound package of butter may be delivered to a consumer 50 or 100 miles from the factory for 22 cents, the Government paying promptly for loss or failure to deliver in good condition. This has exerted a marked influence in improving the general quality of the butter made.

Cheese is made in all the grazing regions of France, in almost every-one of a different character. Some sorts are made from cream alone, some from unskimmed milk, and some from the milk of goats. Probably, the larger part of it is made from skimmed milk, the most of which is thus utilized, and the lean, leathery cheese which constitutes a large part of the food of the people is thus produced. Practically it contains the greatest possible proportion of casein and the least possible proportion of fat. The taste for it is almost universal in France, and it is much used in soups and in preparations of macaroni. It is much more highly esteemed than the richer varieties. The leanest of all skimmed-milk cheese is exported to the United States in considerable quantities, where it is sold at a much higher price, as an imported rarity. If made of exactly the same constituents in an American dairy, it would probably be impossible to sell it at any price.

DAIRY ESTABLISHMENTS IN FRANCE.

Dairy establishments in France are of three kinds:

1. "*Laiteries*," or milk depots, which operate in the collection and sale of milk, either in its natural state or sterilized or condensed. Most of them also make a certain amount of butter as an incident to the handling of considerable quantities of milk.

2. "*Beurreries*," which closely resemble our creameries, being chiefly devoted to the production and sale of butter. Nearly all of them, however, unite with the production of butter the making of cheese from the milk from which the cream has been taken. This cheese, usually designated as "Maigre" to distinguish it from the "Gras" or rich cheese made from unskimmed milk, is a very important product, being largely used by all classes of people, not only in its normal state, but in the preparation of many appetizing dishes.

3. "*Fromageries*," or cheese factories, as we would term them. Many of these do something in the way of butter making also, it being

rarely found necessary to use all the richness of the milk for cheese of any sort, except those which are made wholly of cream and are of a waxy consistency and often of a most pervasive odor. The ordinary French cheese is emphatically a product of unrelenting economy, nothing being allowed to go to waste which anyone can be induced to buy and eat.

There are in all France 2,056 dairy establishments which are reported as working on some sort of associated basis. In some cases, the milk is bought from the producers at a fixed rate, and the manufacturer risks the profit or loss. In others the milk producers hire the manufacturer at a fixed or relative salary, while in still others a purely cooperative system prevails. The number of private dairies is very large, but is not obtainable by any means at my command. In the table of dairy associations given herewith, they are arranged by department. Some of these dairies are very large, averaging several thousand pounds of butter or cheese per day during the summer. Those making large quantities of both butter and cheese are reported under both heads. Of the whole number of associated dairies, only 28 are reported as using centrifugal separators. How many such are in use in private dairies I am unable to say.

Dairy associations in France.

Departments.	Creameries.	Cheese factories.	Milk depots.
Ain	3	23	....
Aisne	14	25	12
Alpes (Basses)	....	2	....
Alpes (Hautes)	2	48	....
Alpes (Maritimes)	1	1	3
Ardeche	....	....	1
Ardennes	5	7	3
Ariege	5	5	5
Aude	....	1	....
Aveyron	1	29	12
Bouches du Rhone	1	2	6
Calvados	47	118	18
Cantal	1	25	1
Charente	5	5	15
Charente Inferieure	23	10	33
Cher	1	12	3
Cote d'Or	8	10	8
Cote du Nord	....	....	2
Creuse	2	2	1
Dordogne	....	2	....
Doubs	24	80	29
Drome	2	10	5
Eure	14	25	21
Eure et Loire	8	6	12
Finistere	38	2	20
Gard	4	....	1
Garonne (Haute)	1	2	1
Gironde	1	....	8
Herault	6	....	2
Ille et Vilaine	25	8	16
Isere	16	49	15
Jura	1	11	3
Landes	1	1	....
Loir et Cher	1	1	3
Loire	....	9	1
Loire Inferieure	6	4	6
Loiret	....	4	5
Lot et Garonne	....	....	2
Lozere	1	16	2
Maine et Loire	6	5	3
Manche	13	2	6

Dairy associations in France—Continued.

Departments.	Creameries.	Cheese factories.	Milk depots.
Marne	5	33	11
Marne (Haute)	9	19	11
Mayenne	2	2	1
Meurthe et Moselle	....	2	2
Meuse	7	27	11
Morbihan	2	3	2
Nord	13	31	39
Oise	1	14	21
Orne	2	17	2
Pas de Calais	3	20	13
Puy du Dome	1	24	1
Pyrenees (Basses)	2	2	2
Pyrenees (Hautes)	1	1	1
Rhone	2	17	....
Saone (Haute)	16	28	21
Saone et Loire	2	5	3
Sarthe	4	9	4
Savoie	8	80	3
Savoie (Haute)	11	89	9
Seine Inferieure	25	72	8
Seine et Marne	2	31	33
Seine et Oise	....	8	46
Sevres (Deux)	7	3	33
Somme	3	6	3
Tarn	....	9	1
Vendee	9	8	15
Vienne	3	24	2
Yonne	....	....	3
Total	427	1,044	585

Taken as a whole, the French dairy system is a wonderful exhibition of the national inclination toward economy. The greater part of the skimmed milk and buttermilk is utilized for human consumption, only the leanest of whey being fed to hogs. It not only supplies a population of 38,000,000, to almost all of whom cheese is a staple article of diet, but it exports large quantities to other countries, including the United States. Considering this fact and the infinite variety of its production, the apprehension naturally arises that American dairy machinery may not fully meet the requirements of the French dairymen. At the same time, I am fully satisfied that if a system of cheese making equally efficient with that of France, coupled with a consumption of cheese as general among all classes prevailed in the United States, it would prove a most valuable addition to our domestic production, and a very agreeable and healthful substitute for the more costly meat products on the table of the average American and generally regarded as essential to a vigorous existence.

MACHINERY.

There are several French, German, and Belgian firms who advertise various articles of dairy machinery, including separators, and solicit orders for the installation of complete dairy plants in all parts of France. How such plants compare with American machines and methods I am unable to say.

As to the establishment of agencies for the sale of dairy machinery in France, our manufacturers would better inform themselves through skilled experts, who can give the matter personal and continued study for several months, as to prices and suitability. In doing so, attention should be given to the matter of making the use of new machinery attractive to people not given to labor-saving devices. This is especially needful when one remembers that the farm labor, male and female, employed in the French dairy is amazingly cheap, averaging not more than 50 cents per day, so that a machine which saves a considerable amount of manual labor may really not be a desirable part of a dairy installation. The cost of the machine, danger of breaking, with perhaps the necessity for a higher grade of employees to operate it, may even incline the dairymen to regard the larger number of laborers as the better investment. These questions can only be determined by one having practical knowledge of the operation and cost of such machinery, after consultation with the French dairyman, whom he will find as thoroughly posted as to his own interests as any salesman can be of the merits of his wares.

In dairies making the finer qualities of cheese, such as the Roquefort, which have to be kept in caves for months, and sometimes for years, to cure and ripen, it is necessary to have a considerable force of employees to care for them. These employees are, in a sense, skilled operatives, because only people of experience can perform such service. As it occupies but part of their time, however, they are available morning and evening for the ordinary work of the dairy, for which they seem to be quite sufficient. It may be doubted whether our dairy machinery would be of great value in connection with such establishments.

ALBION W. TOURGÉE, *Consul.*

BORDEAUX, *July 17, 1902.*

MARSEILLES.

BUTTER IN FRANCE.

There are no creameries in the vicinity ot Marseilles and the butter manufactured locally is produced on a very small scale by dairymen who satisfy a limited retail trade. Butter is a luxury, only consumed to a limited extent by the well-to-do, and quite unknown to the mass of the population, who depend upon oil as a substitute. As there is no pasturage to speak of in this portion of France, there is no prospect of doing anything here with American machinery, and the successful importation of American butter would be contingent upon the erection of a cold-storage plant of modern proportions, something which does not at present exist.

The importations of fresh butter at Marseilles amounted to 17,600 pounds in 1901 and of salted butter 116,938 pounds. These importations were divided between eight or ten countries. The exportations amounted to 1,153,563 pounds of fresh butter, of which 880,000 pounds went to Algiers, and of salted butter, 274,379 pounds.

Aside from Swiss and Italian butters, which are recognized as of first-class quality, the only importations of consequence come from Australia, and this trade does not seem to have been successful up to this time. The Australian quality is complained of and the price is not specially attractive.

There is no local demand whatever for salted butter, and none is ever likely to be created.

It is possible that if American exporters cared to risk the capital necessary to the proper handling of butter and fresh-meat products in this market, they might do something not only in the local trade but in furnishing ships, thousands of which seek this port. The colonial trade could also be satisfactorily handled from Marseilles. Present average wholesale prices are 50 cents per kilogram (2.2046 pounds) for cooking butter, and from that price to 67 cents for higher grade butters. Present retail prices are: Ordinary and Milan butter, 77 cents per kilogram; Brittany butter, 96 cents.

The desirable butter trade is controlled by manufacturers in the northern districts of France and in the neighborhood of Milan, Italy. Italian butter is considered equal if not superior to any offered in this market, and I judge that the Italian manufacturers are equipped with modern appliances. In my opinion, there is a bright prospect for the sale of American creamery machinery in the mountainous region north of Marseilles, where the natural conditions are extremely favorable and where very little is at present being done in this line.

CREAMERIES AND MACHINERY.

I have recently returned from a journey of several days in the department of Isère, where I observed splendid pasturage and an ample supply of the best milk in nearly every peasant's hands. There is at present a very limited attempt to collect this milk for manufacturing purposes, and as the peasants usually control but two or three cows they are obliged to retain their cream for a number of days before a sufficient quantity collects for them to convert it into butter. Old-fashioned processes are followed, and the quality is therefore only ordinary. There are a few large creameries near Grenoble, but I found nothing important being done at any point, although the region is sufficiently rich to supply all central Europe with butter.

I doubt very much whether direct sales of machinery could be made at present. Success would be more likely to follow, in my opinion, if American manufacturers would do as I have known them to do in the United States—that is, seek favorable locations for the manufacture of butter, erect creameries, and make contracts with the farmers for the delivery of their milk. Organizations of this character, put into running order, could be readily sold out to local capital, much of which is idle and looking for satisfactory local investment. The familiar milk stands, milk cans, and milk trains which one is accustomed to see in many of the agricultural districts of the United States are absolutely unknown in that portion of France of which I now write, and which is within a few hours of a dozen populous cities, several of them, like Marseilles, with each a half a million inhabitants. There is abundant water power in the Isère and the Hautes-Alpes to run such machinery as might be required. Marseilles would be a very desirable point for the distribution of machinery and for the general surveillance of any such scheme as I have above outlined. A very reliable house now handling much American machinery is that of Th. Pilter, 78 rue de la République, who would be in a position to represent American concerns. Another good concern is J. C. Rouzaud, 50 rue de la République. I am satisfied, however, that better results would follow if manufacturers would go into business on their own account in this city and control the trade in all its ramifications. Success might be a little slower, but the permanent results would be more satisfactory.

DUTIES ON MACHINERY.

Machinery in general, including power transmitters, scales, balances, railway material, signals, presses, and apparatus, is dutiable in France at the rate of $2.89 per 100 kilos (220 pounds) when imported from the United States, and $1.93 per 100 kilos when received from nations enjoying the benefit of the French minimum tariff.

ROBERT P. SKINNER, *Consul-General.*

MARSEILLES, *May 13, 1902.*

CALAIS.

This consular district, which consists of two departments in the north of France (Pas-de-Calais and the Somme), is not adapted to grazing, the growing of wheat and the beet being the great agricultural products. The butter used here is produced by the small farmers and sold by them directly to the consumers in the towns and villages.

I know of no creamery in this consular district, and believe that there would be no opportunity for introducing creamery machinery, owing to the want of cooperation on the part of small farmers in the production of milk.

J. B. MILNER, *Consul.*

CALAIS, *May 15, 1902.*

NICE.

There are no creameries in this district. The nature of the department of the Alpes Maritimes is such that the cattle industry exists on a very limited scale. The same remark applies to dairy products.

Of late years, great attention has been paid to the irrigation of lowlands for the creation of meadows, but the resulting production does not even suffice for local consumption. I do not think, therefore, that any special opening exists here for dairy machinery, unless it be such as may be used by hand.

It may be stated that even should a certain amount of land be dedicated to augmenting the production of dairy products, the manufacture by large and improved machinery would scarcely be introduced as the rich plains of Piedmont and Lombardy will easily compete and will continue to furnish this district, as well as many other parts of Europe, with dairy products.

ATTILIO PIATTI,
Vice and Acting Consul.

NICE, *May 7, 1902.*

ROUBAIX.

The department of the North, although agricultural, is unprogressive in the matter of dairy farming. Farms are numerous, but small, and are worked in the old way. Farm laborers desert the farms for mills in towns, where the pay is more remunerative.

CREAMERIES AND OUTPUT.

A few companies have recently started creameries with modern machinery, and farmers are beginning to realize that they must adopt new methods in order to compete with these firms.

Pasture lands in this department are so poor that cattle must be fed on beet tops, brewers' and distillers' waste, grains, and oil cake. The quality of the milk is consequently too poor to produce good butter and cheese, and the department depends largely upon imports of these articles. The customs reports show that butter to the value of $868,500 and cheese to the value of $965,000 were imported into this district during the past year from Belgium, Holland, and Italy.

There are 6 cooperative companies in this consular district, and 71 small farms devoted exclusively to the manufacture of butter and cheese. Small farmers prefer to sell their surplus to small dealers in the adjacent towns, as they get a better price for their products.

No statistics of output are available.

The following is a list of cooperative companies and small farmers in the Département du Nord:

COOPERATIVE COMPANIES.

Sie. An. F. des Laiteries du Nord, 289 Rue Solferino, Lille, Nord.
Sie. An. F. des Laiteries Maroellaises, Maroelle, Nord.
Sie. An. F. des Laiteries de Boulogne, Boulogne, Nord.
Les Laiteries coopératives, Sains du Nord, Nord.
Les Laiteries coopératives, Basuel, Nord.
Sie. An. F. des Laiteries de Cartignies, Cartignies, Nord.

SMALL FARMERS.

MM. Mutte, Clairfayts, Nord.
MM. Rigaumon, Clairfayts, Nord.
MM. Louveau-Mahaut, Boussois, Nord.
MM. Deprez-Obled, Croix près Landrechies, Nord.
MM. Plez-Bailleul, Englefontaine, Nord.
MM. D. Beumont, Englefontaine, Nord.
MM. Ed. Roland, Englefontaine, Nord.
MM. A. Roland, Englefontaine, Nord.
MM. Eug. Roland, Englefontaine, Nord.
MM. C. Paul, Elrœunt, Nord.
MM. L. Lobry, Favril, Nord.
MM. Caudmont, Fontaine au Bois, Nord.
MM. Druesne, Fontaine au Bois, Nord.
MM. A. Trouillet, Fontaine au Bois, Nord.
MM. Bethegnies-Vienne, Forest par Landrechies, Nord.
MM. Gerard, Jeulain, Nord.
MM. L. Bertaux, Marbaix, Nord.
MM. J. B. Colos, Mareschies, Nord.
MM. J. Cuvellier, Mecquignies, Nord.
MM. Bonnaire, Orsenval, Nord.
MM. Briatte, Poix du Nord, Nord.
MM. A. Haussy, Saint-Hilaire, % Helpe, Nord.
MM. L. Hedon, Saint-Hilaire, % Helpe, Nord.
MM. S. Michel, Saint-Hilaire, % Helpe, Nord.
MM. Baligand, Semousies, Nord.
MM. Hannequart-Lecerf, Semousies, Nord.
MM. Maufroid, Semousies, Nord.
MM. Pecquereaux, Semousies, Nord.
MM. Thiroux, Semousies, Nord.
MM. Vandermarcq, Semousies, Nord.
MM. Gerard, Vieux Mesnil, Nord.
MM. A. Bar, Villereau, Nord.
MM. L. Cartignies, Villereau, Nord.
MM. F. Druart, Villereau, Nord.
MM. R. Dupont, Villereau, Nord.
MM. F. Gerard, Villereau, Nord.
MM. J. L'Heussier, Villereau, Nord.
MM. Cornet, Gouzeaucourt, Nord.
MM. Cornu, Gouzeaucourt, Nord.
MM. Devillers-Dubois, Gouzeaucourt, Nord.
MM. Delacourt-Levegue, Maretz, Nord.
MM. Noiret, Maretz, Nord.
MM. Zetard, Maretz, Nord.
MM. A. Dupont, Ors, Nord.
MM. Mathieu, Ors, Nord.
MM. Bera, Saulzoir, Nord.
MM. Baurlet, Saulzoir, Nord.
MM. Carlier, Saulzoir, Nord.
MM. Deudon, Saulzoir, Nord.
MM. V. Cornu, Solesmes, Nord.
MM. P. Lobry, Solesmes, Nord.
MM. O. Moity, Solesmes, Nord.
MM. Drecourt, Fenain, Nord.
MM. Tonnerre, Fenain, Nord.
MM. Lurlure-Requier, Landas, Nord.
MM. Broy, Lawin-Planques, Nord.
MM. Legrand-Aligard, Lawin-Planques, Nord.
MM. Thelier, Lawin-Planques, Nord.
MM. Vendeville, Lawin-Planques, Nord.
MM. Desprez-Puvion, Masny, Nord.
MM. E. Ghuraert, Soex, Nord.
MM. Lebrun-Poix, Louvignies, Nord.
MM. Cartignies, Cassel, Nord.
MM. Vermersch-Hilst, Cassel, Nord.
MM. Monchicourt, Potelle, Nord.
MM. Corduant-Dubois, Faisnièrés en Thierache, Nord.
MM. Broussier-Flament, Faisnièrés en Thierache, Nord.
MM. A. Barbry, Aubers, Nord.
MM. H. Ringot, Aubers, Nord.
MM. E. Dequesne, Colleret-Ostergnies, Nord.

PROSPECTS FOR NEW ENTERPRISES.

As absolutely pure butter is almost unknown in this market, it is my judgment that any company willing to furnish an honest article to the public would be able to do a fine business and command remunerative prices.

GOVERNMENT ENCOURAGEMENT.

I know of no direct encouragement given by the Government to creamery industries. In all expositions of cattle, there are sections for dairy produce, and agricultural societies of the district distribute prizes according to the American method. Most of the large towns have a yearly exposition.

IMPORTS.

Most of the machinery comes from England, Germany, and the United States. The business is done through Paris agents, who supply small dealers and farmers direct.

BEST POINT OF DISTRIBUTION.

As Lille is the principal distributing point in this district, it would be the best point to establish a plant for the manufacture or sale of creamery machinery.

W. P. ATWELL, *Consul*.

ROUBAIX, *May 12, 1902*.

NORMANDY.

CREAMERIES AND OUTPUT.

There is no region in France where more luxuriant pasturage, where finer herds of animals for dairy purposes may be found, or where better butter is made than in Normandy. In this ancient division of France, in fact throughout the whole country, the greater part of the butter is made on farms, where the farmers churn their cream once or twice a week. The small farmers, on account of the cost, can not supply themselves with a complete equipment of modern dairy machinery, as their individual production is so limited that the expense of installation divided among a small output would increase the cost of production too much.

There are, however, some of the larger farmers who handle their milk and make their butter by the latest improved methods. Besides the above, there are manufacturers who either buy their milk from the farmers in the neighborhood or who purchase the farm-made butter on market days through their agents, send it by rail to their factories to be reworked and blended for exportation, or for sale in the country or in Paris by the grocers.

The manufacturers are generally well equipped, and employ nearly the same methods as are in use in Denmark and in the United States.

The consular district of Havre embraces the whole of Normandy with the exception of the department of Eure and the eastern portion of the department of the Seine Inférieure, and, in addition, the department of Ille-et-Vilaine and Mayenne.

There are no statistics published which give the number of creameries in this district, for, as stated above, almost every farmer is a butter, cheese, or milk producer; but according to the "Annuaire de la Laiterie, Beurrerie, and Fromagerie" of 1902, the directory for the dairy industry, there were, in addition to the farmers, the following manufacturers of dairy products in the consular district of Havre at the commencement of the present year:

Number of manufacturers of dairy products, 1902.

Departments.	Cheese.	Butter.	Cheese and butter.	Creamery.
Calvados	131	48	9	2
Ille-et-Vilaine	5	15	5	5
Manche	2	15	....	4
Mayenne	4	2	....	....
Orne	17	1	....	....
Seine Inférieure	71	25	7	10
Total	230	106	21	21

Among the largest butter makers may be mentioned Ernest Leboucher, Mendeville (Calvados); Roussel & Dupont, Isigny (Calvados); Beurrerie de l'Angle, Autram-sur-Couesnon (Ille-et-Vilaine); Samim & Benard, Vitré, (Ille-et-Vilaine); Lepelletier, Carentan (Manche): Allcard, Périers (Manche); Bretel Frères, Valognes (Manche).

The latter are the largest manufacturers of butter in France, their production being 40 tons per day.

The annual production of butter in France is estimated at 400,000,000 pounds and of cheese 300,000,000 pounds.

According to official statistics of the minister of agriculture, there were, in 1900, 7,819,582 cows in France, with a milk production of 2,231,229,185 gallons, valued at $252,348,273; average value per gallon, 11.3 cents.

In the following table are given the number of cows, the milk production, and the average rate per gallon for the departments in the consular district of Havre:

Dairy statistics, consular district of Havre, 1900.

Departments.	Number of cows.	Milk production.	Value.	Average value per gallon.
		Gallons.		*Cents.*
Calvados	104,551	66,220,013	$8,707,355	13.1
Ille-et-Vilaine	443,033	119,188,995	15,071,543	12.6
Manche	167,531	63,455,662	7,838,598	12.4
Mayenne	94,284	17,953,794	1,573,933	8.8
Orne	106,085	31,389,047	2,292,992	7.3
Seine Inférieure	167,366	64,235,448	6,322,917	9.8
Total	1,082,850	362,442,959	41,807,838	[a] 10.7

[a] Average.

I know of no new dairy enterprises, but many of the agricultural societies and syndicates are becoming alarmed at the retrograde movement of the exports of French dairy products, due to the competition of those made by Denmark, Sweden, Norway, Australia, Canada, and Siberia.

Cooperative societies are advocated, similar to those already formed in the departments of Charente and Charente Inférieure. Around the central society of the latter departments (Association Centrale des Cooperatives des Charentes et du Poitou) are grouped 91 cooperative creameries, which handle the milk of 52,000 families, members of the societies. They produce 8,000 tons of butter per year, valued at more than $6,000,000. At the exposition at Paris in 1900, the cooperative creameries of the Charentes obtained two grand prizes, one for their permanent exhibition in the Galerie des Machines, and the other in a special competition for the excellence of their products.

The cooperative movement in the western part of France is only in its infancy, but it bids fair to increase in importance, notwithstanding the difficulty in convincing a Norman farmer that it is to his interests to join with his neighbors in creating a central creamery, which, being fitted with up-to-date dairy machines, would handle his products with better results than he could himself.

OUTLOOK FOR AMERICAN MACHINERY.

From letters received from agricultural societies, syndicates, farmers, dairy proprietors, and manufacturers of butter and cheese in this consular district, I learn that the machines in use are either of French or Danish manufacture, and that little is known of American machines.

Th. Pilter, of Paris, is the agent for the Alfa-Ravae & Cooley dairy machines, and I have heard of several shipments of Sharples separators; but it would appear to me that in a country where the dairy industry is so important as it is in France, American dairy machines should be more extensively used. At this time, there is a constant and growing demand for centrifugal separators, such as could be used on small farms. The United States consular agent at Honfleur writes me that good centers for the sale of separators and machinery for dairy products are Caen, Bayeux, Isigny, and Lisieux. At the latter place, one of the French manufacturers sells 200 separators a year.

PRICES OF MACHINES.

To enable American manufacturers to form an idea of the competition they would have to meet, I give the prices of churns, butter workers, separators, etc., which are quoted by one of the principal French manufacturers, and one who in the past three years has built up a good trade.

The prices are subject to a discount of from 5 to 10 per cent, according to the size of the order, and include packing, accessories, and delivery at the manufactory.

Churns.—Simple oak churns, made to stand on a table, with a total capacity of from 2.64 to 15.85 gallons, range in prices from $6.37 to $11.58. Churns with stands, having a total capacity of from 2.64 to 52.83 gallons, range from $8.10 to $25.48. The barrel of the churn is made of oak, and over a total capacity of 26.42 gallons the churns have two handles. Larger and more strongly made churns, model 1900, with total capacities of from 31.13 to 105.67 gallons, range from $19.30 to $53.08. Power churns, model 1900, with total capacities of from 105.67 to 211.34 gallons, for use in large creameries, range from $108.08 to $165.98, including countershaft.

Butter workers.—A simple butter worker, with no mechanical gearing, which can work 2.2 pounds of butter, sells for $2.90. A rotary horizontal butter worker, with machinery run by hand, capable of working 2.2 pounds of butter, sells for $10.62; one capable of working 6.61 pounds, for $15.44. Large horizontal power rotary butter workers, for use in large creameries, capable of working 440.9 pounds of butter per hour, are priced at $193. Vertical butter workers, run either by hand or by power, capable of working from 220.46 pounds to 661.38 pounds per hour, range in prices from $41.50 to $89.75.

Centrifugal separators.

Capacity.	Price.	Capacity.	Price.
10.57 gallons per hour	$27.99	66 gallons per hour	$77.20
13.21 gallons per hour	33.78	79.25 gallons per hour	98.43
19.81 gallons per hour	38.60	92.46 gallons per hour	101.32
39.63 gallons per hour	67.55		

The above are worked by hand.

The following are prices for power separators, and include fast and loose pulleys.

Capacity.	Price.	Revolutions per minute.
1[illegible]1 gallons per hour	$56.94	55 to 60
33.02 gallons per hour	59.83	55 to 60
39.63 gallons per hour	83.00	50 to 55
66.05 gallons per hour	92.64	50 to 55
79.25 gallons per hour	114.84	45 to 50
92.46 gallons per hour	117.73	45 to 50
184.92 gallons per hour	212.30	1,100

Hand machines for molding butter, for making pats of 125, 250, and 500 grams (0.275, 0.551, and 1.1 pounds), mold not engraved, $8.68. Engraving of mold costs from $1.93 to $3.86, according to pattern. The same machines with an automatic attachment for opening the molds, $17.37. For large creameries a power machine, capable of making 200 pats an hour, costs $43.42.

Cheese presses.—A simple press, of light construction, diameter of plate 17.7 inches, sells for $18.91; the same, of heavier construction, $26.05; a double press, diameter of plate 19.68 inches, price $54.04.

MANUFACTURERS AND DEALERS.

Among the principal manufacturers and dealers in dairy machines, whose machines are sold and extensively used in France, may be mentioned Edm. Garin, Cambrai (Nord); P. Williame & Co., 27 Rue du Louvre, Paris; Gaulin & Co., 86 Rue Myrha, Paris; Th. Pilter, 24 Rue Alibert, Paris; Jules Carpentier, Ernée (Mayenne); Carl Holmbergs, Lund, Sweden.

DUTY ON DAIRY MACHINERY.

The duty on dairy machinery, such as churns, separators, butter workers, etc., when imported direct from the United States into France is 15 francs ($2.89½) for 100 kilos (220.46 pounds) net; when imported via a European country, there is a surtax of 3 francs 60 centimes (69.48 cents) per 100 kilos.

The duties on steam, gas, petroleum, compressed-air, and hot-air motors imported at the same time as the dairy machinery, and intended for use in running it, are, per 100 kilos (220.46 pounds) net: Weighing 250 kilos (551.15 pounds) and more, 18 francs ($3.47); weighing less than 250 kilos, 30 francs ($5.79); refrigerating machines weighing 250 kilos (555.15 pounds) and more, 20 francs ($3.86); weighing less than 250 kilos, 30 francs ($5.79).

The surtax is also applied to the above machines when imported indirect through a European country.

The duties on dairy machinery imported into France from Denmark and Sweden are one-third less than those on similar products imported from the United States, as the former nations, having a commercial treaty with France, enjoy the benefits of the minimum tariff.

GOVERNMENT ENCOURAGEMENT.

The encouragement given by the French Government to the dairy industries consists in the courses in dairying given in the national schools of agriculture and in the National Dairy School, in the prizes offered by the Government in local exhibitions, and in the subventions granted to certain of the agricultural societies which are expended in many prizes, in furnishing medals, and in establishing fairs for the exhibition of dairy products. There are also 24 semi-private schools in France, devoted exclusively to the teaching of the theory and practice of butter and cheese production and to all subjects pertaining to the dairy industry.

OUTLOOK FOR AMERICAN MACHINERY.

There is, in my opinion, a field in France for the sale of American dairy machinery, more especially for small, handy separators, which are fast coming into use among the farmers. But it would be necessary, in order to achieve success, to exploit the field properly. This outlet must not be considered as an occasional expedient for disposing of surplus products in seasons of overproduction, but it must be carefully studied. The success which the manufacturers of American harvesting machinery have met with in France is well known. This is due not only to the excellent quality of their products, but also to the systematic and intelligent manner in which they have brought their machines to the attention of the French consumer. If the manufacturers of American dairy machinery would do likewise, I feel convinced that they would meet with good results. They can not expect to establish a trade in a foreign country by wasting money in scattering broadcast catalogues printed in English, or by correspondence. They must establish agencies in the centers of consumption, from which catalogues printed in French could be distributed and where practical demonstration of the working of the dairy machines could be made, where orders could be received, and information as to prices, etc., be given.

If our manufacturers of dairy machinery would wish to investigate the question and would come to this Consulate, I would furnish them with information which would enable them, with as little delay and expense as possible, to form an opinion as to whether it would pay them to establish an outlet in France.

A. M. THACKARA, *Consul.*

HAVRE, *July 17, 1902.*

ROUEN.

CREAMERIES.

French statistics do not coincide geographically with this consular district, and I have found it impossible to tell the exact number of dairies. However, one is safe in saying that they exist everywhere. Probably no superior natural advantages exist anywhere for the production of an excellent quality of butter and milk. The climate of the country is mild, damp, and equable, the meadows are many and vast, and their grassy fruitfulness nourish thousands of the very best breeds of cattle.

OUTPUT AND CONSUMPTION.

This is another question difficult to answer, for the reason given above. It has been remarked that probably no other country in the world of like size produces more good butter than Normandy. The town of Isigny, Calvados, sends some 6,000,000 pounds annually to Paris, while from the little town of Gournay, with only 4,000 inhabitants, there is sent 3,000,000 pounds. Millions of pounds of Norman butter finds its way annually to the London market, where it commands the highest price. The department in which this consulate is situated, Seine-Inférieure, produces annually about 70,652,378.454 gallons of milk. Only three departments of France produce more: Nord, 120,491,546.952 gallons; Manche, 78,314,470.248 gallons, and Ille-et-Vilaine, 73,515,059.352 gallons.

The importation of butter and cheese into France averages about one-half of the exportation, the figures being approximately $7,720,000 and $15,440,000, respectively.

The consumption of butter in Normandy and throughout the north of France is greater than in any other part of the country, perhaps for the reason that nothing else is, generally speaking, used for cooking purposes. It is to the Norman kitchen what olive oil is to the kitchens of middle and southern France, and what lard and cottonseed oil are to the United States. The consumption of dairy products in France is greater also, because in making up his diet a Frenchman searches for the most nourishing food, such as butter, cheese, eggs, milk, etc. Buttermilk he never drinks; it is given to the pigs.

PROSPECTS FOR NEW ENTERPRISES.

The introduction of creamery machinery into this district depends upon three conditions: (1) It must give better results with less expense than the machinery at present employed; (2) it must cost less; (3) ocular and tangible proof must be given of the first two conditions. This latter is the only thing that will make a Norman buy anything, and even then he reflects considerably before purchasing. Where an American asks, "Does it do it quickly," a Frenchman asks, "Is it economical?" The prospect for the establishment of new dairies and the introduction of American creamery machinery is not so good, perhaps, because of the many dairies already existing, and the machinery put upon the market by Paris manufacturers, which, as far as I am able to judge, is of the most improved kind. Cuts and prices of this machinery are given elsewhere in this report.

GOVERNMENT ENCOURAGEMENT.

I am informed by one of the editors of L'Agriculture Moderne, Paris, that the encouragement given by the French Government to the milk, butter, and cheese dairies amounts practically to nothing. The departmental professors of this branch aid the establishment of laiteries, but only when the object is cooperative. This is virtually all, with the exception that in some departments, dairy schools have been established.

DUTY ON DAIRY MACHINERY.

The tariff for most of the utensils employed in creameries is listed in the French schedule under the head of agricultural machines, which are admitted for 15 francs ($2.895) per 100 kilos (220.46 pounds). This list, in addition to all farm implements, embraces churns, metallic or other; milk brouetts with tin reservoirs, mounted on wheels; simple skimmers of all kinds; skimmers with refrigerating system; curdlers; "pasteurisateurs," or sterilizers (rubber tubes not comprised); concentrators; condensers, in which the brass or bronze is not over 50 per cent of the total weight; machines for kneading butter; cheese machines and presses, and, in fact, all machines for the complete installation of milk, butter, and cheese dairies. However, milk refrigerators composed of a copper serpentine and a receiver of tinned iron, when weighing less than 250 kilos (551.15 pounds), are admitted at 30 francs ($5.79), and if over 250 kilos, at 20 francs ($3.86) per 100 kilos (220.46 pounds).

PRICES OF MACHINERY.

Most of the machinery used in this district is manufactured either at Louviers or Paris. Bills are usually payable in ninety days or at 2 per cent discount for cash. All prices are for the machine as it stands in the manufactory. Loading, freight, and placing are at the buyer's expense. A hand skimmer (fig. No. 1[a]) capable of disposing of 75 liters (19.8135 gallons) an hour sells for 190 francs ($36.67); the same skimmer using 125 liters (33.0225 gallons) an hour is sold for 235 francs ($45.35), and disposing of 225 liters (59.44 gallons) an hour for 350 francs ($67.55). Arranged for motor power, the price is from 40 francs ($7.72) to 50 francs ($9.65) more. A cold-water skimmer (fig. No. 2) holding 20 liters (5.2836 gallons) can be bought for from 60 francs ($11.58) to 130 francs ($25.09). A mechanically driven skimmer (fig. No. 3) capable of disposing of 1,000 liters (264.18 gallons) an hour, with an average of 6,000 revolutions per minute, is sold for 1,350 francs ($260.55). A "pasteurisateur," or sterilizer (fig. No. 4), disposing of 400 liters (105.672 gallons) an hour is worth 325 francs ($62.725), and with a capacity of 2,000 liters (528.36 gallons), 550 francs ($106.15). The iron feet as shown in the cut are not included in these prices. Refrigerators for sterilized milk (fig. No. 5) without the cover and capable of using 250 liters (66.045 gallons) cost 190 francs ($36.67); with the cover, 230 francs ($44.39). The same refrigerator with a capacity of 3,000 liters (792.54 gallons) sells for 1,350 francs ($260.55) with the cover, and without cover for 1,200 francs ($231.60). A churn similar to fig. No. 6, holding from 50 liters (13.209 gallons) to 150 liters (39.627) gallons ranges in price from 80 to 130 francs ($15.44 to $25.09). Mechanically driven churns, which are used almost altogether by the industrial or cooperative laiteries, capable of holding from 100 to 500 liters (26.418 to 132.09 gallons) range in price from 150 to 400 francs ($28.95 to $77.20). Small "malaxeurs," or kneaders, capable of kneading 2 kilos (4.4092 pounds) at one time retail for from 35 to 55 francs ($6.755 to $10.615). Horizontal rotative kneaders with a capacity of 6 to 10 kilos (13.2276 to 22.046 pounds) are worth 200 francs ($38.60); with a capacity of 25 to 30 kilos (55.115 to 66.138 pounds), 400 francs ($77.20).

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[a] The six illustrations mentioned will be found at the end of this report.

FRENCH MANUFACTURERS OF CREAMERY MACHINERY.

L. Nusslé, Louviers, (Eure).
Simon Frères, Cherbourg.
P. Willame et Cie., 27 Rue du Louvre, Paris.
E. Bréhier et Cie., 52 Rue de l'Ourcq, Paris.
H. Carpentier, 73 Boul. Soult, Paris.
Chalifour et Cie., 24 Rue Vicq-d'Azir, Paris.
E. Chauveau, 6 cité de Phalsbourg, Paris.
Ducourtioux, Jne, 17 Rue Grenier-St.-Lazare, Paris.
Frédéric-Fouché, 38 Rue des Ecluses-St. Martin, Paris.
J. Gaillard, 201 Rue de Vanves, Paris.
Gaulin et Cie., 170 Rue Michel-Bizot, Paris.
Hignette, 162 Boul. Voltaire, Paris.
V. Maugin, 30 Rue Basfroi, Paris.
Pilter, 24 Rue Alibert, Paris.
R. Wallut et Cie., 168 Boul. de la Villette, Paris.
Labbé frères et Cie., 5 Rue de la Fidélité, St. Florent (Cher.).
Garin à Cambrai (Nord).

NORMAN DAIRY PROCESSES.

Generally, the cows are milked three times a day. Instead of our milking pail, a 2-gallon, jug-shaped vessel of lacquered metal lined with tin is employed. In this the milk is taken to the dairy and strained through a sieve lined with clean linen into pans of burnt earthenware nearly 2 feet deep. These are arranged in rows upon the brick floor or upon benches a foot and a half or 2 feet high. As all Norman dairies are run upon the raw-cream system, milk is allowed to stand from twenty-four hours in summer to forty-eight in winter. The cream is placed in earthenware jars, where it remains until the next churning. The prevailing custom is to take every particle of cream from the milk. Churning is done twice or, at most, three times a week, with cream at a temperature of about 57° F. The temperature of the milk room is always raised artificially. The most primitive establishments, in the absence of other means, raise the temperature by burning charcoal in a small brazier or iron crock. The churn mostly used in this district is known as the Norman barrel churn, which has fixed dashboards of thin laths too short to reach to the circumference of the churn. There are one or two large openings according to the size of the churn, and a vent peg used as a ventilator is placed at the head; the spigot is fitted at the bulge. In small dairies, churning is done by hand; in the larger ones mostly by horse power.

It must not be be understood from the above that no really advanced systems of butter making exist in this district. There are dairies in Normandy with a milk room, butter room, and scullery, or washing room, with a 4-horsepower steam engine to drive the machines. There is also a cellar under the milk and butter rooms in which the butter is cooled and packed in hot weather. Upon the farm, about 40 cows are milked, and their yield, together with some 500 gallons purchased daily and collected by sending a cart around to the neighboring small farms, is separated usually by a De Laval separator capable of handling 100 gallons of milk an hour. The milk is placed in a tank having a double casing at the bottom, into which steam can be turned to procure the right temperature before separating. From this tank, the milk is run into the separator. As there is no demand for the separated milk, it is used for feeding calves, pigs, and poultry, the value being reckoned at 2 cents a gallon.

As soon as the cream is separated, it is cooled by one of Lawrence's capillary refrigerators, fixed in the milk room, and then allowed to stand in earthenware jars until the morrow, by which time it is slightly sour and ripe for churning. This process, which is done by an engine-driven churn, requires from forty to fifty minutes. When the butter is taken from the churn it is placed in linen bags, fastened to hoops, and taken to a machine called the "delaiteuse," which is fixed in the milk room and is used to extract every drop of buttermilk and water from the butter. This is done by centrifugal force, the speed being from 800 to 1,000 revolutions a minute. From this machine the butter is put in a circular worker, which is also fixed in the butter room. When taken from this worker, the butter is made up for the market; if for the wholesale trade, in lumps of from 20 to 30 pounds, stitched in thin linen or muslin, and packed in hampers lined with straw. If, however, the butter is intended for retail, it is made up in pounds and half pounds by a self-gauging butter press, which molds the butter into shape and stamps it with a design or monogram. When once the exact weight has been ascertained and the machine set, only about a pound in every fifty need be weighed to test the machine's correctness. These "prints" are put in grease-proof paper, packed in boxes, and placed in the cool cellar until they are sent to market by an evening train, thus obviating the exposure to heat during transit, and insuring delivery in Paris early in the morning. During the whole process of manipulation, the butter is never by any chance touched by hand.

For the above description of Norman dairy processes, I am indebted to Monsieur A. Watt.

THORNWELL HAYNES, *Consul.*

ROUEN, *May 22, 1902.*

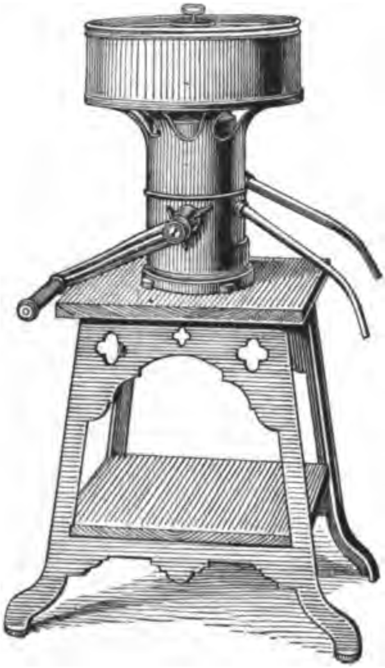

FIG. 1.—A hand skimmer.

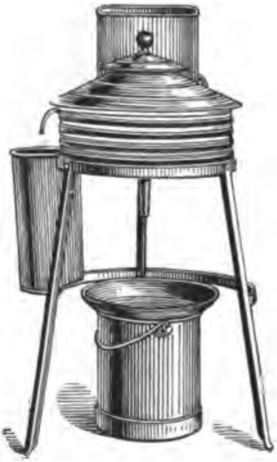

FIG. 2.—A cold-water skimmer.

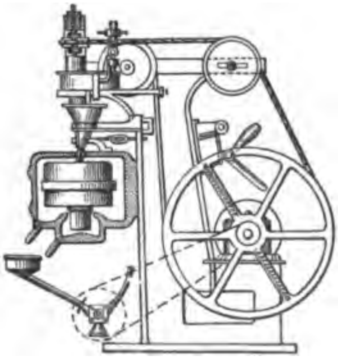

FIG. 3.—A mechanically-driven skimmer

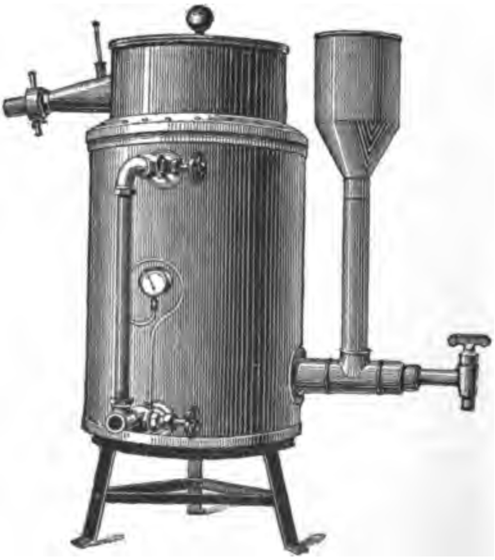

FIG. 4.—A pasteurisateur or sterilizer.

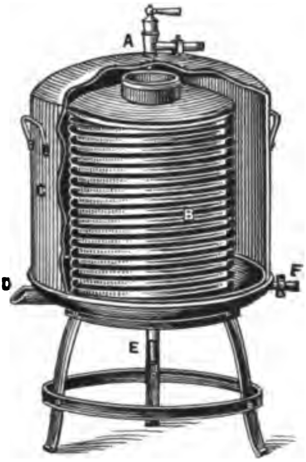

FIG. 5.—Refrigerator for sterilized milk.

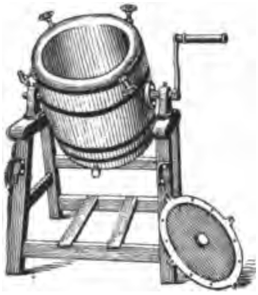

FIG. 6.—A churn.

PARIS.

CREAMERIES AND OUTPUT.

There are in Paris at the present time nearly 450 establishments, having an average of 12 cows each, giving about 20 pints each per day. The consumption is about 220,000,000 quarts per annum, or an average of nearly half a pint of milk per head per day. In the suburbs of Paris, there are about 1,200 dairies, with an average of 12 cows each.

EXPORTS OF BUTTER AND CHEESE.

The creamery business may be said to be one of the most important industries in France, and the supply is more than equal to the demand, large quantities of butter and cheese being exported. One department of France alone (Calvados) exports butter to the amount of 25,000,000 francs ($4,925,000) annually, principally to England.

PRICE OF MILK.

The price of milk in Paris varies from 6 to 10 cents per quart. Some firms deliver it, guaranteed pure, in glass bottles, sealed, direct to the customer.

The principal firms are: Laiterie de Corneux, 4 Rue de Maubeuge, Paris; Bachimont & Co., 132 Faubourg Saint Denis, Paris; L. Nicolas, 22 Rue Paradis, Paris; Duhot, 28 Rue Louis Morard, Paris; Laiterie de Royaumont, 68 Rue Chaussée d'Antin.

MACHINERY IN USE.

The requirements of the trade are fairly well supplied by the French manufactures, and very little foreign machinery is used.

Creamery machinery, if much superior to the French models and not higher in price, would possibly succeed, but on the whole there does not seem to be any special opening in this direction.

JOHN K. GOWDY, *Consul-General.*

PARIS, *July 20, 1902.*

RHEIMS.

CREAMERIES AND OUTPUT.

There are in this consular district, composed of 8 departments, with a population of nearly 3,000,000, about 65 creameries, large and small, distributed as follows:

Location.	Population.	Creameries.
Aisne	545,500	6
Ardennes	325,000	4
Marne	435,000	9
Aube	255,500	12
Meuse	292,350	21
Meurthe et Moselle	464,150	1
Vosges	412,190	9
Haute Marne	244,500	3
Total	2,974,190	65

At Sompuis, Marne, is located the only cooperative creamery reported in the consular district.

There are no statistics available for determining the output of these factories. Much of the land in the district is not suitable for feeding cattle, but in the department of Meuse, in the valley of the Meuse River, and in the department of Aube, which is traversed by the Seine River, dairying is one of the principal industries.

There has been as yet, however, very little association of capital for the purpose of carrying on the business scientifically with up to date equipments. As a rule, each farm manufactures its own product.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for new enterprises of this kind should be good in almost any locality in France suited to dairying, but it would be necessary to manufacture the products which the people are accustomed to using. Nine-tenths of the cheese consumed is of the soft varieties, such as the Camembert, the Brie, the Marole, and others, and nearly all the butter is unsalted.

There are a few localities in France where the butter is salted when made, but at Paris and in this part of the country, it is difficult to buy salted butter. Here soiling is practiced, the cattle are fed in the stall, and dairy products are immediately sold. The unsalted butter, if immediately consumed, is very delicious.

CREAMERY MACHINERY.

In regard to creamery machinery, I give the translation of a letter received from Dr. H. Freal, of Chaumont-Porcien, Ardennes, who is largely interested in the creameries of his section:

CHAUMONT-PORCIEN, *Ardennes, June 6, 1902.*

MONSIEUR LE CONSUL: The appurtenances actually employed in our creameries are partly French and partly Danish, many of our separators coming from Denmark.

For cheese the utensils are primitive, and improvements are very hard to introduce. The introduction of new machines can only be made after a satisfactory trial, and for my part, I am in favor of employing only the utensils of well-known marks which are suited to special installation. I have known of the sale of several machines, mainly separators, which have not worked well. There is abundant room for improvement in separators. At present, these machines are too delicate to stand the strain of the rapid speed with which they are run, and I would be glad to see a marked improvement in this respect.

I think that all who have had occasion to put their separators in the attic on account of their inefficiency are of my opinion. Several years ago, complicated machines called radiators were put upon the market. After trial they proved failures, and they are no more spoken of. If you have a new machine, I should be very glad to know about it and to study it.

Receive, Monsieur, etc.,

H. FREAL.

As far as my investigations go, I can not find that there is in use in this part of France any dairy machinery made in the United States.

It requires intelligence and great perseverance to introduce new goods in France, because the people have a natural disinclination to change.

It is certain that the latest improved dairy machinery in use in the United States is far superior to that in use at present in France; but it would require experienced salesmen, acquainted with the goods, and much persistence to introduce them in this country.

HOW TO INTRODUCE AMERICAN MACHINERY.

The best place to establish headquarters for the sale of the goods would be at Paris.

The Deering Harvester Company and other agricultural implement makers have established agencies there. The surrounding country has been worked by traveling salesmen, who have established branches at various places. The business has been managed with great ability, and American mowers and reapers, particularly, are sold in large quantities every year. Exhibitions have been given and the machines put to work in the fields. There, they have shown the superiority of the work they could do, and the sale of one machine has been followed by many more.

The French must be convinced of the utility of a thing by object lessons, and those who desire to find a market in France may well profit by the example of these successful agencies.

WM. A. PRICKITT, *Consul.*

RHEIMS, *June 28, 1902.*

ST. ETIENNE.

CREAMERIES.

In the consular district of St. Etienne, there exist no creameries at present. Some few years ago, an industry of the kind was established a few miles from St. Etienne with all modern improvements, chiefly of Danish origin, but for some reason or other the owners had to abandon it, not being able to make the butter as cheaply as the farmers in the old-fashioned way.

I was told also that the butter manufactured at this place was mixed with margarine, and could not sell in consequence. Be that as it may, the enterprise fell through and has never since been renewed.

Near the town of Vichy, celebrated for its mineral waters, a very large creamery existed for many years, but it also failed in the end and, discouraged by these results, no attempt has been made to reopen it.

The prospects of the creamery industry, as understood by us at home, are particularly bright in France, for the following reasons:

The climate is very favorable in general for stock raising. Severe winters are the exception and there is never anything here to be compared with the cold of the northern part of the United States.

The soil is about the richest in Europe; the pasture lands are very extensive, and in ordinary years yield a grass of excellent milk-producing qualities.

The French breed of cattle is in general very good; that known as the Normandy breed is much sought after by dairymen.

On the other hand, milk is cheap in France; it sells in the provinces (large towns) at 4 cents the liter (1.057 quarts).

A description as to how the milk is distributed to the large city of St. Etienne will give an idea of what might be the prospects of a regular creamery plant in the district, inasmuch as the system is pretty generally followed elsewhere.

The farmers from considerable distances outside the town send every morning by teams the milk in sealed tins, containing from 4 to 15 liters (4.23 to 15.85 quarts), to their private customers and to the grocers for retail. For this they pay 5 francs (96.5 cents) a month to the carrier. The private customer pays for the milk at the rate of 4 cents the liter, and so does the grocer, who sells it in his turn to the public at the same price, but his profits come in by a special arrangement universally recognized here, by which the grocer only pays the farmer for six days in the week, while the seventh (Sunday) he sells it to his own exclusive profit. Now, if under these conditions a creamery were established in the country districts, the farmers would find it to their advantage to supply the factory with milk at even a lower price than 4 cents; at least those who do not make their own butter.

The butter in this part of the country is made after the old fashion.

Dash churns prevail, and no machinery is employed. It is natural to suppose that malaxing by hand can not sufficiently "cure" the butter, consequently it is rather coarse and charged with water and salt, by which it gains weight to the detriment of the consumer. However, the people are used to it and do not grumble.

PRICES.

The price at which the butter is sold varies naturally with tho seasons. At this period of the year (June) the price is 22 cents, which is considered rather high for the season; in winter it goes up to 30 cents per pound.

Some machine-made butter is imported from the outside departments and commands a higher price, as it is much superior to the handmade article; it costs 10 cents more per pound.

From the foregoing, it will appear that there is every reason to believe that a creamery worked on the well-known American lines would have a fair chance of succeeding.

Hilary S. Brunot, *Consul.*

St. Etienne, *June 18, 1902.*

TROYES.

I visited to-day a large creamery near this city and send the information I have gathered. The various operations in succession are:

The patrons of the creamery bring in the milk. For making cheese, it is put in a large tank, where it is heated by steam to a temperature of 93° F. in winter and 83° F. in summer. It is then drawn off in tubs and rennet added. After the milk is curdled, it is placed in molds to make the cheeses called Camembert, the Brie, and the Coulommiers—all soft cheeses. The next day the cheeses are taken from the molds, salted, and sent to the drying room, from which they are taken to the cellars to finish them.

For making butter, the important utensil is the separator. In this creamery they use one called "The Melote." It is round in form, and made of steel and galvanized iron. The milk is put in and the cream is separated by centrifugal force. The capacity of the machine I saw, which could be operated by power or by hand, is 140 quarts an hour. The cream is placed in the churn, and the butter when made is put upon a butter worker to separate it from the buttermilk.

The kettle for heating the milk for cheese was made by Gauline & Bauzan, No. 86 Rue Myzha, Cherbourg; the butter worker by M. Simon, of the same city. The separator was made by M. Garine, at Cambrai.

Gaston Baltet, *Consular Agent.*

Troyes, *June 8, 1902.*

GERMANY.

DUTY ON MACHINERY.

[Extracts from the reports of Consul E. A. Creevey, of Glauchau, and Consul J. F. Monaghan, of Chemnitz.]

The duty on dairy machinery under the German tariff is determined, not by the nature of the machinery, but by weight and material of construction. The term machine is given a technical construction in the German tariff regulations. Machines of small dimensions and simple construction, designed especially for domestic use and hand manufacture, such as butter-making machines with special mechanical contrivances, are not classified as machines under the German tariff. But machines, simple or otherwise, particularly designed for use on a large scale and used in factories, are considered machines, and as such are subject to the duty on machines, the rate being as follows: Machines made wholly or mostly out of wood, 3 marks per 100 kilograms (71 cents per 220.46 pounds); machines wholly or mostly out of cast iron, the same duty; machines wholly or mostly out of wrought iron, 5 marks ($1.19) per 100 kilograms; and machines wholly or mostly out of "other baser metals," such as copper and brass, 8 marks ($1.90) per 100 kilograms. Under the last head are classified those machines in which the total weight of "other baser metals" exceeds that of either wood, cast iron, or wrought iron. For example, a machine weighing 100 kilograms (220.46 pounds), containing 40 kilograms (88 pounds) of brass and tin (other baser metals), 30 kilograms (66 pounds) of wrought iron, and 30 kilograms of cast iron, is dutiable under the head of machines made of "other baser metals" at the rate of 8 marks ($1.90) per 100 kilograms. But if instead of having 30 kilograms of wrought iron it had 30 kilograms of wood, it would be dutiable at the rate of 3 marks (71 cents) per 100 kilograms, which is the duty on both wood and cast iron. When machines are imported in separate parts, or knocked down, the calculation is made, not on the machine as a whole, but on the parts separately, and these are dutiable on the basis of that material predominating in weight, as the calculation is made on the part and not on the machine. Small machines for home use for butter making, etc., as before referred to, are not classified as machines, but are subject to a rate of duty based on weight and material of construction, and are classed as furniture, woodwork, etc., depending upon the kind and quality of wood, style, and general character of make-up. While a definite statement is impossible, the following will give some idea as to the rates on articles not classified as machines per 100 kilograms (220.46 pounds):

Plain woodwork, 10 marks ($2.38).

Cast iron, 3 marks (71 cents).

Wrought iron, from 6 to 50 marks ($1.428 to $11.90) and more, all depending upon the quality and amount of work done upon the iron and the amount of nickeling, polish, etc. Therefore, articles classified as machines are favored by the German tariff.

EXHIBITION OF CREAMERY APPLIANCES.

Reply to the Department's circular relating to the subject of creameries and dairy appliances was purposely deferred until after the opening of the German agricultural exposition (Deutsche Landwirtschaftlische Austellung) in this city on June 5, it being hoped that additional data might be secured for a report on the subject.

The exposition, as heretofore, has brought together a vast array of agricultural machinery and products from all parts of the Empire and from several foreign countries, and affords some opportunity to make comparisons, obtain prices, etc.

While the exhibit of dairy machinery and appliances is somewhat limited in its scope, the manufacturers of cream separators are especially well represented. The conclusion is easily reached that this branch has awakened much interest in the Empire, though it would be impossible to obtain reliable figures as to the present output of this machinery for use here. Many large concerns, such as that of Heinrich Lanz, of Mannheim, best known as manufacturer of thrashers and traction engines, have taken up the manufacture of dairy appliances and similar articles as side lines, and it is too soon to obtain figures as to the amount of business done by them.

Fourteen exhibits of cream separators were noted at the exposition. Of these, 1 is American, 1 Swedish, 1 from Glasgow, and the remainder of German make. Most of the machines are small and intended to be operated by hand, although several of the exhibitors advertise machines for steam or other power. The separators are somewhat similar in appearance and construction, and all involve the same principle of separating cream from milk by means of rapid centrifugal motion. The differences in the machines are chiefly in the mechanism of the cylinder and in the use, in some, of belts, and in some of gearing to transmit power from the crank to the cylinder. It may be fairly said that the German machines of this class show a tendency toward lightness of construction and ease of operation which do not usually appear in German made agricultural machinery and appliances. Taken as a whole, no other class of machinery made a better showing in point of finish, or seemed to awaken more interest among visitors of the exposition.

Inquiry of several exhibitors shows that the use of cream separators in Germany dates from about 1897, and that they have been growing rapidly in favor, especially in those parts of Germany where farming is carried on somewhat extensively. It would seem also that the German manufacturer is alert to this growing demand and has the field fairly well occupied. Dairy appliances, being simple in their construction, can probably be manufactured and placed upon the market by the German factory as cheaply as the American manufacturer can hope to sell them in this country.

A comparison of the price lists of 12 of the exhibitors shows much uniformity in price. The following figures, taken at random from the lists, may be accepted as about the average prices. It will be noted that the variance is slight in separators of the same capacity.

Name of exhibitor.	Capacity per hour.	Price.	
	Liters.[a]	*Marks.*	
Sharples, Westchester, Pa	140	250	$59.50
	180	280	66.64
	225	370	88.06
	300	450	107.10
	450	550	130.90
Heinrich Lanz, Mannheim, Germany	160	225	53.55
	220	260	61.88
	225	300	71.40
	325	380	90.44
	450	500	119.00
	525	600	142.80
Joseph Meys & Co., Hennef, Germany	150	260	61.88
	200	340	81.16
	300	410	97.58
	450	530	126.14

[a] One liter = 1.0567 quarts.

As may be assumed, each exhibitor claims for his separator superiority in the large percentages of butter fat extracted from the milk, ease of operation, etc. Official analyses, testimonials, and other evidence are offered in support of these claims.

CATTLE EXHIBIT.

The exposition has given new emphasis to the growing interest taken in Germany in cattle raising and in the dairy business. In the live-stock department, 702 head of cattle were exhibited and among them a surprisingly fine exhibit of milch cows of several well-known breeds. The fact that in most of Germany, cattle are not permitted to run on pastures but are kept in the villages would seem to favor the establishing of small creameries in the villages, especially as cellars suitable for keeping milk are rare.

CREAMERY BUTTER.

Creamery butter already commands a higher price in market. This fact will tend to popularize large creameries, as well as the use of small separators to be operated by hand.

OUTLOOK FOR AMERICAN MACHINERY.

How far our manufacturers may share in supplying this demand will depend mainly upon the price at which such appliances can be sold in this market and the energy used in their introduction. The number of native concerns engaged in this branch of manufacturing certainly insures competition with any new concern which may enter the field.

H. W. HARRIS, *Consul.*

MANNHEIM, *June 9, 1902.*

NORTH GERMANY.

CREAMERIES AND OUTPUT.

The "creamery," as it is now known in the United States, differs somewhat in its organization and methods from the "Mölkereien" or milkeries of Germany, which are mainly cooperative societies (Molkereigenossenschaften), made up largely of farmers leagued together and organized for the purpose of marketing their milk in cities or manufacturing it on a large scale and by improved methods into butter and cheese.

Of these organizations, there was in Prussia at the end of 1899—the last year for which complete statistics are available—1,013, and in Saxony 479, a total for North Germany of 1,492 milkeries, most of which make butter, and perhaps one-third make both butter and cheese. The district of a United States consulate in Germany, being a purely arbitrary division of territory, has no separate German statistics, so that it is only possible to state that the 857 Prussian milkeries are divided between the several provinces as follows: In Brandenburg, 241; Hanover, 201; East Prussia, 29; Schleswig-Holstein, 156; Silesia, 39; West Prussia, 69; Westphalia, 81; Pomerania, 52; Hesse-Nassau, 10, and the Rhine provinces, 135.

It has not been found possible to obtain a complete and exact return of the total output of butter, cheese, cream, and milk from the milkeries of North Germany for any given year. As an example, however, may be cited the 69 establishments of West Prussia, which in 1899 produced together 663,513 pounds of butter, which was sold at an average wholesale price of 99 marks ($23.56) per centner, or 21.37 cents per pound.

During the same year the 156 milkeries of Schleswig-Holstein handled 12,499,600 kilograms (equal to 326,201 gallons) of milk, a large proportion of which was devoted to the manufacture of butter.

SANITARY INSPECTION.

Throughout every step and department of this industry it may be assumed at the outset that modern scientific methods are employed here not only from choice, but because the sanitary laws and local regulations of Germany maintain a rigid and careful supervision over the care and preparation of every form of human food. Milk is especially susceptible to deterioration and infection either through diseased animals or unclean, infected surroundings. No other department of public supply receives more careful and constant supervision from the sanitary police than the dairies, the cream and milk stores, the butter stalls, and the large depots which receive dairy products from the country for the supply of retail dealers and large individual consumers.

MACHINERY IN USE.

There are in Berlin four manufactories of dairy machinery and appliances, and more than fifty others in various locations throughout Germany. These not only provide practically the entire supply of the machinery used in this country, but a considerable surplus for export to Austria, Russia, and Scandinavia. The catalogue and price list of one of the principal manufactories of this class in Berlin is transmitted as an exhibit with this report. It will show better than any written description could do the kinds of apparatus used for dairying on an industrial scale in this country, where the whole science of milk sterilization and presevation, cheese and butter making is not only thoroughly understood and taught in special schools, but remorselessly insisted upon, and the most careful methods enforced by the sanitary police. There is nothing in centrifugal separation, the influence of temperature upon milk at every stage of its treatment, and the overshadowing importance of cleanliness, in respect to which the best German dairymen have anything to learn from the practice of other countries.

OUTLOOK FOR AMERICAN MACHINERY.

Reduced to its simplest practical form, the whole question which forms the germ of the Department's present inquiry turns upon the point whether American makers of dairy apparatus have more effective, serviceable, or cheaper machinery than is yet made in this country for doing what the best modern practice requires to be done. Americans have a recognized supremacy in improving and perfecting every mechanical process or apparatus that they seriously employ, and it is very possible that in this case the most advanced manufacturers in our country have reached a position at which their improved fixtures would have a definite practical interest in Germany. To what extent this is true is a question for expert investigation, not for any amateur judgment by a layman.

If the American makers of dairy machinery wish to seriously test the value of the German market for their specialties they can only do so most effectively by sending a competent expert to examine thoroughly the apparatus and methods which are utilized here and compare them with those at home. If American machinery and processes are better or cheaper—either or both—than those now employed in this country, there will be found here a ready market for improvements, at least until they have been copied and adopted by German makers, whose susceptibility to new ideas from the United States is admittedly alert and discriminating.

POINTS OF DISTRIBUTION.

The examination can be most readily and effectively made in the provinces of Hanover, Brandenburg, and Schleswig-Holstein, and the best points for the introduction and sale of American dairy machinery, should the market be found inviting, are Hamburg and Berlin. Hamburg, as a free port, enjoys the advantage of enabling importers, whose warehouses are in the free zone of that city, to reexport their imported goods to Scandinavia, Russia, or the Netherlands without passing the frontier and becoming thereby subject to German duties.

FRANK H. MASON, *Consul-General.*

BERLIN, *May 22, 1902.*

AIX LA CHAPELLE.

In a general manner, I find this section of Germany is well supplied with creameries. I visited two and found them equipped with German and Scotch machines.

Creameries average 500 pounds of butter daily; they often gather the milk themselves, although in some instances farmers gather it; it is weigbed, and they pay farmers for cream per calculation and weekly local price of butter. The majority of the farmers have small hand separators and separate at home immediately after milking.

The following firms handle milk and dairy machines in Aix la Chapelle: H. Beckers, Nachfolger, Bastin, Pontstrasse 86; Carl Scheins, Seilgraben; Schultz Bastin, Nachfolger, Pontstrasse.

I inclose a full report on the subject by Vice-Consul Reuter.

FRANK M. BRUNDAGE, *Consul.*

AIX LA CHAPELLE, *June 24, 1902.*

VICE-CONSUL REUTER'S REPORT.

[Inclosure in Consul Brundage's report.]

CREAMERIES AND OUTPUT.

A good many of the creameries in the consular district of Aix la Chapelle are organized into cooperative companies, controlled and advised by the Rhenania Dairy Union, with headquarters at Bonn on the Rhine. There are 137 local companies, with 14,589 members.

Each local company has full cooperative rights and can transact business.

Each member is liable with his whole property for the liabilities of his local union. There exist 16 companies where the responsibility of each member is fixed at a limited sum.

The Rhenania Dairy Union (Molkereigenossenschaft für Rheinland) which represents property of approximately 12,000,000 marks ($2,856,000), handled last year about 180,000,000 quarts of milk, and paid to its members 6,137,869 marks ($1,460,812) for the cream.

The rest of the milk is returned to the delivering member.

The Rhenania Dairy Union sold about 6,400,000 pounds of butter and received over 7,650,000 marks ($1,820,600) therefor.

The receipts for sold products were about 7,900,000 marks ($1,880,200).

The total expense for handling and selling ranged between 5 pfennig (1.19 cents) per pound for the large steam creameries to 40 pfennig (9.5 cents) for hand separators.

The union companies purchased over 200,000 marks ($47,600) worth of machinery for distribution to local creameries.

The creameries, with a very few exceptions, are in healthy condition, doing an excellent business in a large and ready market, with a great surplus of buyers for first-class graded butter.

The following table contains a list of the larger local cooperative creameries in the consular district of Aix la Chapelle. Always address, Landwirthschaft und Molkerei Verein, at—

Bittburg,
Burgbroht,
Kirchberg,
Mehnen,
Buschhausen,
Eynatten,
Cornely Munster,
Wermelskirschen,
Oberweis,
Weinsheim,
Neuenahr,
Utterrath,
Bergen,
Kleinbltenstätchen,
Lützel L.,
Meirenburg,
Beeckrath,
Elberfeld,
Eshweiler,
Hunsheim,
Hohkeppel,
Eickenich,
Bergnenstadt,
Kellwig,
Neunkirchen,
Töhnen,
Kehr,
Vliesen,
Walheim,
Alsweiler,
Tliesen,
Blankenheim,
Hamminkiln,
Heinsberg,
Mandern,
Antweiler,
Almersbach,
Kaisersesch,
Hillesheim,
Brünen,
Pümpten,
Weismes,
Beek,
Sponheim,
Capellen,
Saarn,
Drevenack,
Altendorf,
Bauchen,
Tiefenbach,
Homberg,
Vülfrath,
Hilden,
Brünen,
Herwiehl,
Altenkirchen
Mehren,
Mayschoss,
Volklingen,
Pahlem,
Bleialf,
Linnich,
Zülpich,
Berkum,
Hillesheim,
Palleiden,

Theley,
Mehren,
Büdesheim,
Ludweiler,
Bolingen,
Lutzerath,
Repelen,
Haminkeln,
E. Kwyler,
Waldesch,
Walheim,
Keepelen,
Merschweiler,
Tripsrath,
Wissmar Rh.
M. Gladbach,
Gilrath,
Volpertshausen,
Trohnhausen.
Imgenbroich,
Paaden,
Munstermaifeld,
Kleinsheim,
Holpe,
Sarn,
Friesenhagen,
Limbach,
Manderscheid,
Adenen,
Lien,
Unter Vlatten,
Bullingen,
Wisskirchen,
Pasburg,
Röhl,
Idenheim,
Bengel,
Flammersfeld,
Rheinböllen,
Altenar,
Orsoy,
Hunree,
Amel,
Burgsolms,
Biskirchen,
Steele,
Hochemmerich,
Haarzopf,
Tevern,
Kahnen,
Lützellinden,
Kintzenbach,
Flammersfeld,
Selbach,
Lichtenberg,
Munstereifel,
Hundsbach,
Hamm,
Iverrath,
Simmern,
Türch,
Polch,
Call,
Pudeldorf,
Leiwen,
Trier,
Obermendig,
Limmerath,
Müllenborn,
Burgbrohl.

GOVERNMENT ENCOURAGEMENT.

Creameries receive no subsidies from the Government, but the Provincial Government Bank advances money on easy terms to any local cooperative union at 3 per cent. It is to the Government, however, that the industry owes its progress and success, through the assistance of a strong staff of men of the highest academical standing, who lead the conservative German farmer to better methods of working, as shown at the numerous experiment stations.

This fact should be fully appreciated by any American desiring to operate in the dairy implement and machinery line.

MACHINERY IN USE.

A hand separator with a capacity of 250 to 300 quarts an hour, of the highest grade and best workmanship and uniform quality, honestly built for long use, requiring not more than 40 to 50 handle turns, for one man, easy to clean and easy to reset, and leaving not more than 0.015 to 0.020 per cent of butter matter in 38° Celsius milk, and possibly combined with a handy milk heater, still meets a strong demand in this district, when examined and approved and indorsed by the union board of examiners at Bonn, or by the State Agricultural Academy and experiment station at Poppelsdorf (Rhenish), or by the provincial Molkerei Anstalt and Versuchs station at Zulpich (Rhenish), which are always ready to try any machine presented to their judgment.

The selling properties of any creamery machine would be greatly enhanced by the approval and testimony of the following institutes and experiment stations:

Milchwirthschaftliche institutes of Greifswald, Hameln, and Proskau, North Germany; the Milchwirthschaftliche versuchstations of Weihinstephen and Weeschen, Bavaria, and the agricultural and experimental stations of Tulda, Gerabrunn, and Klein Tappian.

A very effective mode of conquering a market in Germany for improved machinery is to show how to work it in the district expositions and agricultural fairs of the Molkerei Union and the branch district expositions of the Agricultural Society of Rhenania.

Many different types of hand and steam separators are used in this district—some of poor make and needing constant repairing.

The newest type is Burmeister & Wain's "Perfect," considered also the most efficient: Height, 81 centimeters; drum contains a quart of milk; handle turns 50 times a minute; milk handled at cow temperature leaves 0.02 fat matter in milk; from starting to full speed, two and one-half minutes; stops in seven minutes, and handles 159 quarts of milk per hour.

The "Melotte," 1 man, 60 turns a minute, handles 128.3 quarts of milk per hour at 33.5° Celsius, producing 0.159 cream and 0.841 milk, and leaves 0.016 fat matter in skimmed milk.

The "Westfahlia" of Ramsohl & Schmidt, in Oelde Westphalia, 50 turns, handles 207 quarts of milk at 36° Celsius, giving 0.15 cream, and leaving 0.021 fat matter in skimmed milk.

Schedule of prices.

Quantity.	Value.	
	Marks.	
50 quarts	120	$28.56
75 quarts	160	38.08
100 quarts	200	47.60
150 quarts	250	59.50
200 quarts	320	76.16

BAMBERG.

CREAMERIES AND OUTPUT.

There are in this consular district 455 creameries, with 2,185 cows. Most of these creameries are run by individual concerns.

The approximate daily output of these creameries is 29,000 liters (30,700 quarts) of milk, one-third of which is sold in its natural condition; the rest is used for butter making, producing about 4,000 pounds German (3,638 American pounds), valued at about 1.10 marks (26.20 cents) a pound at retail.

MACHINERY IN USE.

To separate the cream from the milk, they use almost exclusively the Swedish hand separator, made by the Alfa-Laval Separator Company, of Stockholm. These separators cost from 120 to 560 marks ($28.56 to $133.28), according to size, and their capacity of separating runs from 40 liters (42¼ quarts) to 450 liters (475½ quarts) an hour.

After separation of the cream, they use a butter barrel (butterfass) to make the butter. This barrel is operated in the larger creameries with steam, and costs 135 marks ($32.13); for hand use, it can be bought from 60 to 120 marks ($14.28 to $28.56).

For cooling, they use mostly a cooler made near Hamburg, the price of which I have not been able to discover.

PROSPECTS FOR NEW ENTERPRISES.

In this part of Germany the soil is only fairly good and pastures are not very rich. It would therefore seem that there would be little chance for new enterprises in this line.

GOVERNMENT ENCOURAGEMENT.

The State does not help the industry by direct contribution, but does advance capital at a low rate of interest to establishments which have good prospects.

The Kingdom of Bavaria, to which this consular district belongs, in order to further the theoretical part of the industry, has established a regular bureau in the interests of creameries with an expert at its head, and furnishes, free of charge, annual courses of study for young men who desire to enter the creamery business.

OUTLOOK FOR AMERICAN MACHINERY.

Manufacturers of creamery machinery should establish agencies at one or more of the larger commercial centers, such as Hamburg, Berlin, or Frankfort, and send first-class agents over here to introduce it.

The question of establishing plants for the manufacture of such machinery here can easily be solved by the manufacturer himself, after first trying the plan of importing his goods.

W. BARDEL.

BAMBERG, *June 10, 1902.*

BARMEN.

CREAMERIES AND OUTPUT.

The consular district of Barmen comprises that part of Rhenish Prussia which is called the "Wupperthal," with its large chemical and textile works, and the greater part of the province of Westphalia, with its coal and ore fields and great steel and iron industries.

To the best of my information, there are only a few creameries in the province and these are cooperative.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for the establishment of new enterprises in this line are not very good, as the greater portion of fresh milk is brought daily to the cities for consumption, what is left being churned into butter by the small farmers and sold to the house trade. Under these circumstances, the opening of agencies for the distribution of American creamery machinery in this consular district would not be advisable.

MACHINERY.

There are a great many manufacturers of creamery machinery in Germany, but the Swedish separator seems to be the choice in the larger creameries using steam or electric power.

MAX BOUCHSEIN, *Consul.*

BARMEN, *May 22, 1902.*

BRUNSWICK.

CREAMERIES AND OUTPUT.

In the duchy of Brunswick there are 75 partnership creameries, 2 incorporated creameries, and 10 large private creameries. These employ steam or other motor power. Besides these, there are a large number of small private creameries, which do not use steam, employing hand centrifugals.

The quantity of milk used in a corporation, or large private creamery varies according to its size and capacity and amounts to between 1,200 and 10,000 liters (317 and 2,641.8 gallons) daily. One can calculate on an average daily consumption of 2,500 liters (660.42 gallons) milk for each creamery. The yearly consumption of the real establishments, aside from the small farm and estate creameries, would be from 20,000,000 to 26,000,000 gallons.

There are no statistics as to the consumption of milk in the creameries, and these figures are based only on estimates.

PROSPECTS FOR NEW ENTERPRISES.

The duchy is well provided with creameries. From time to time new ones are established, and often in places where not sufficient milk for their consumption exists or where the participation on the part of the farmers in them is so small, or the expenses of management so high that they turn out unprofitably. Therefore the prospect of founding new enterprises in this line in the duchy no longer exists.

GOVERNMENT ENCOURAGEMENT.

No promotion or support is given by the Government for the establishment of creameries. It is not required, as wherever the conditions are favorable for the erection of a creamery, this is effected without difficulty.

MACHINERY IN USE.

Creamery machines are imported from Sweden and Denmark and rarely, especially in the duchy, from the United States. The German machines are now so complete that the necessity for importation from foreign countries does not exist. The market for such machines in the duchy is small, and whether the importation of American machinery would pay is problematical. A foreign firm would not find it easy to introduce its products here, because, on the one hand, a tolerably sharp competition already exists among the domestic firms, and on the other hand, in districts where agriculture is advanced, every farm sends its milk to a creamery which is supplied with apparatus in accordance with the prevailing systems represented by large firms in Germany, and in case of necessity different parts of machinery or new supplies can be obtained from these firms without difficulty.

If the American manufacturers would send their machines to the exhibitions, especially to the German exhibition of the society of agriculture (des "Deutschen Landwirtschaftlichen Vereins"), which takes place annually, it might be of advantage. A large number of experts and persons interested in such goods assemble there, and inventions and new products receive appropriate attention. For instance, the large German firms which manufacture creamery machinery display at these exhibitions what is called a "model management;" and a "model creamery" managed in American style would undoubtedly attract notice.

The most used milk machines ("Milchschleudern") are the Alfa separators. The so-called Danish centrifugal is imported from Copenhagen. The general German agency for the first is the Bergedorfer Eisenwerk, Bergedorf, and for the latter Eduard Ahlborn, Hildesheim. These are the two most important firms in Germany in this line of goods, and they will readily furnish their price lists and catalogues upon application. The products of the domestic firms of "Carlshütte," near Regensburg, and Reinhard & Messmer, Flensburg, are used to a smaller extent, but are not inferior in quality to those of the firms previously mentioned.

The popularity of the Alfa separator and the Danish centrifugal is due chiefly to the circumstance of their earlier introduction. There are a great many manufacturers who produce milk vessels, cans, etc., particularly apparatus for cooling milk, tanks, etc. The names of some are C. Thiel & Söhne, Lubeck; Tremser Eisenwerk, Trems bei Lubeck; Joseph Fliegel, Mallmitz, Schlesia; Korkmann, Ahlem in Westphalia. There are a number of others, and all will gladly furnish catalogues and price currents, etc., if requested.

PRICES OF MACHINERY.

The following are the prices of the latest Alfa-Laval steam turbine separators sold by the Bergedorfer Eisenwerk above referred to: With a capacity of 79.25 gallons per hour, $100; 184.92 gallons per hour, $185.64; 528 gallons per hour, $414.60. The prices for these large "steam turbine separators" of the firm of Eduard Ahlborn, of Hildesheim, are the same. This firm produces, however, a number of small "hand centrifugals," the prices of which vary between 160 and 260 marks ($36.08 to $61.88), separating from 75 liters (19.81 gallons) to 200 liters (52.83 gallons). The prices are catalogue prices, goods to be delivered at the railroad station of the place of manufacture. Discount for cash and time payments can be arranged.

TALBOT J. ALBERT, *Consul.*

BRUNSWICK, *June 18, 1902.*

CHEMNITZ.

Four creameries are located in Chemnitz, namely, the Chemnitzer Dampf Molkerei, the Elektrische Molkerei, the Genossenschafts Molkerei, and the Schweizer Milchkuranstalt. The latter is not a true creamery, but rather a healing resort, where specially prepared milk is used.

MACHINERY.

In the Elektrische Molkerei the power is supplied by a 3-horsepower electric motor fed by a current from the city power house. This concern consumes 1,200 liters (1,260 quarts) in the manufacture of cream and butter, and sells some 3,000 liters (3,150 quarts) of fresh milk daily. It employs one butter-making machine, costing 150 marks ($35.70); one butter kneader, costing 300 marks ($71.40); one Alfa De Laval separator, costing 1,300 marks ($309), and another separator of Danish make, costing 800 marks ($190). It is reported that the machines in most common use are the Alpha De Laval separator, which is the separator as invented by De Laval, of Sweden, and improved by Bechtolsheim, a German. The patent is reported to be held by a Swedish corporation located at Stockholm. The German representative is Bergedorfer Eisenmarkt, of Bergedorf, near Hamburg.

The most commonly employed churns in Saxony are the Holstein machine Victoria, the American swinging churn, and the Lefeld and plain German box churn. Here and there in the Erzgebirge the old-fashioned vertical plunger churn is still in use.

Rotary butter kneaders are installed in the creameries.

Periodical tests of the percentage of butter fats contained in the milk are required to be made under public supervision. For this purpose, the Soleth apparatus is in general use. For the creaming of the milk, separators are mainly used in the vicinity of Dresden and Leipzig, while in the upper Erzgebirge the old method of drawing off the skim milk by means of a faucet is still commonly employed.

J. F. MONAGHAN, *Consul.*

CHEMNITZ, *September 2, 1902.*

COBURG.

CREAMERIES AND OUTPUT.

There being no large cities in this district—the largest counting only about 25,000 inhabitants—creameries that could compare in any way with the large establishments in the United States do not exist in this central portion of Germany, while the situation, in the midst of the Thuringian Mountains, offers very little opportunity for agricultural enterprise on any but the most limited scale.

Farmers living near town furnish their customers fresh milk once or twice a day. Butter and cheese are made on their premises and sent to market every Wednesday and Saturday. Up to about ten years ago, peasants living far out in the country had little or no chance for profitably employing the milk produced in excess of what they wanted for their own consumption, and it was only about 1892 that they began, at least in this part of the Empire, to form cooperative creamery companies, which give each member a chance of disposing, day by day, at a reasonable price, of his excess of milk production.

At present, there exist half a dozen of such companies in this district. They are all worked on about the same line as the one of which I had occasion to make a special study. It was founded in 1895, and at the end of 1901 it had 242 members, who during last year furnished about 1,500,000 liters (1,595,050 quarts) of milk to the creamery.

MACHINERY IN USE.

A number of milk carts belonging to the company call every day at the farms of the various members and bring the milk to the dairy, which is furnished with a complete plant of new and up-to-date machinery, costing (expenses for freight and setting up included) $2,261. By means of separators the cream is skimmed from the milk, then conveyed to the butter-making machines. In 1901 about 600 kilograms (13,224 pounds) of butter were produced and sold at prices ranging between 50 cents to 57 cents per kilogram (2.2046 pounds). About one-half of the skimmed milk is given back to the peasants, who feed their cattle on it, and the other half is used at the creamery for making various kinds of cheese.

The company of whose workings I have been making a special inquiry (Heldburg) has been doing fairly well so far; its membership, output, consumption, and profits realized have slowly increased year by year. The other five companies in this district are said to be in about a similar condition; the seventh one, however, could not hold its own against the competition of the farmers who refused to join it, and failed two years ago, after an existence of about six years.

PROSPECT FOR NEW ENTERPRISES.

For the reason that most farmers who have a milk production of any importance and live near town prefer to attend to their own dairy business and keep away from the cooperative companies, and, furthermore, owing to the very limited consumption in the few towns, this district can not be said to offer a good chance for new enterprise in the creamery line.

GOVERNMENT ENCOURAGEMENT.

The ducal government is trying its best to increase the interest of the peasantry in up-to-date dairy work by founding new dairy schools and by rendering, if need be, pecuniary or other assistance to those private institutions already in existence.

MANUFACTURERS OF MACHINERY.

There are a number of large factories in Germany giving special attention to the manufacture of dairy machinery. The Bergedorfer Eisenwerke at Bergedorf, near Hamburg, and Dierks & Möllman at Osnabrück pride themselves on turning out first-class and up-to-date goods.

CAUTION TO SHIPPERS OF AMERICAN MACHINERY.

It would be well for intending shippers of American dairy machinery to have a German-speaking expert study the special local conditions before entering the trade, as, if such precautions were not taken, it might be found after arrival of the goods that they were not suited to the market.

Another point to which I would like to call the attention of shippers is that it would always be well, before making definite contracts for delivery, etc., to have a thorough understanding with the Imperial customs authorities, and also to send a small test shipment, so as to know exactly the classification and the rate of duty to be charged; if not, disappointments will be certain to occur, with no way of getting redress.

OLIVER J. D. HUGHES, *Consul-General.*

COBURG, *May 29, 1902.*

COLOGNE.

CREAMERIES AND OUTPUT.

According to reports published by the Rhenish Cooperative Association of Cologne and the Rhenish Prussian Agricultural Cooperative Association of Bonn, there were during the past year 76 cooperative creameries in operation in this consular district.

Statistics in this connection concerning creameries other than cooperative are not obtainable. I am informed, however, that there are very few of this nature and that their output is limited and unimportant.

The 76 creameries mentioned purchased during the past year 35,866,305 kilos (77,985,204 pounds) of milk; the greater part of which was used for direct consumption and for cheese making. The gross profits realized from one kilo (2.2046 pounds) of milk were 12 pfennig (2.86 cents) and the net profits 5 pfennig (1.19 cents).

PROSPECTS FOR NEW ENTERPRISES.

It is difficult to form an opinion as to the prospects for new enterprises in this line, as the industry is practically controlled by the cooperative associations, and the opening up of new creameries rests almost entirely with these organizations. The farmers and milk producers also have their cooperative societies and work in harmony with the creameries.

GOVERNMENT ENCOURAGEMENT.

In 1900, the above-mentioned associations received an allowance of 6,000 marks ($1,428) from the State and in 1901 they received a like sum from the chamber of agriculture of the Rhenish Province. In addition, the salary of the inspector of the association, located at Bonn, is paid by the chamber of agriculture, and the Cologne Union receives from the farmers' association the sum of 1,500 marks ($357) yearly.

The creameries situated in the remote and less productive parts of the country receive encouragement in the way of allowances from funds provided by the State for such purposes.

MACHINERY IN USE.

Most of the dairy machinery used in this district is manufactured by German firms, with the exception of what are known as Alfa separators, which are imported from Sweden.

These machines are shipped from Sweden in parts and set up in Germany, in order to take advantage of the minimum tariff.

The Bergedorfer Eisenwerke, in Bergedorf, near Hamburg, make a specialty of setting up this class of machinery.

Recently, a new milk-heating apparatus imported from Denmark has found a ready market in this part of Germany.

The sale of these machines has been pushed by a firm in Dusseldorf, which has advertised extensively and has made practical demonstrations to the different cooperative associations.

POINTS FOR DISTRIBUTION.

Undoubtedly, the most advantageous points at which to open agencies for distribution in Rhineland would be either Cologne or Bonn, the former preferred. Both of these cities are located on the Rhine, and have direct steamship as well as railroad communications with Rotterdam, Antwerp, and other seaports.

PROSPECTS FOR NEW ENTERPRISES.

The establishing of plants for the manufacture of creamery machinery in this part of Germany is a matter which would require careful investigation, as the points which are most desirable for distributing imported merchandise would not, in my opinion, be the proper places for manufacturing purposes.

CHAS. E. BARNES, *Consul.*

COLOGNE, *June 23, 1902.*

DRESDEN.

CREAMERIES AND OUTPUT.

There are four creameries in the city of Dresden, none of which are cooperative, viz, Dresdner Molkerei Gebrueder Pfund, Bautzner-Strasse No. 79; Altstädter Dampfmolkerei Gustav Winkler Nachf., Reitbahn-Strasse; Pieschner Dampfmolkerei H. Thieme Nachf., Leipziger-Strasse 70; Wilhelm Mueller, Markus-Strasse II.

The largest of these is the Dresdner Molkerei Gebrueder Pfund, which, I understand, ranks second in the German Empire. They supply about one-third of the entire demand in Dresden. Their plants extend over several blocks, and are most admirably fitted out and equipped with first-class appliances and machinery. Three thousand cows supply the milk, and in special stables a select stock (from 75 to 100 cows) of the "Simmenthaler" breed is kept under the continual supervision of a district physician. These cows give a superior, pure, and rich quality of milk, which is sterilized according to an own method and is specially adapted for infants and invalids.

There are 158 milk dealers in Dresden, and the daily consumption of milk therein is estimated at about 150,000 liters (158,800 quarts), of which Gebrueder Pfund, as stated, supply one-third; 30,000 liters being brought from the country by peasants, 5,000 liters milked from cows stabled in the city, and the remainder brought by rail from distances running up to 100 miles.

Statistics covering the output and consumption of butter and cheese in Dresden are not obtainable, but the consumption of the latter is quite considerable. Gebrueder Pfund, produce 30 centners (1 centner = 111 pounds), or 6,000 half-pound pieces, of butter per day.

From what I can learn, there are no prospects whatever for new enterprises in this line in Dresden. On the contrary, there is a decided tendency of the wholesale business to gradually remove the retail dealer, because the wholesaler can give the consumers far better guaranty as to wholesomeness, purity, and nonadulteration of his products, and can offer the deliverer or the farmer better and safer conditions of payment. In fact, a number of creameries started business on a small scale during the past few years, but were soon compelled, under the heavy pressure of the large concerns, to abandon the enterprise.

GOVERNMENT ENCOURAGEMENT.

The Saxon Government gives no encouragement in any form to the industry.

MACHINERY IN USE.

All dairy machinery used in Dresden is manufactured in Germany, with the exception of the "De Lavalle" centrifugal machine (for separating skimmed milk from cream), which is imported from Stockholm.

The "Bergedorfer Eisenwerk," of Bergedorf, near Hamburg, are considered the largest and best manufacturers of dairy machinery in Germany.

The principal machines used by Gebrueder Pfund are: Centrifugal machine (for separating skimmed milk from cream), warming apparatus ("Vorwaermer"), sterilizing press, sterilizing apparatus (system "Pasteur"), butter machines, butter-kneading machines, ice machines, cooling apparatus, and filtering apparatus (through pebbles or cloth).

OUTLOOK FOR AMERICAN MACHINERY.

I doubt the possibility of doing a large business in American dairy machinery in this city, because, as stated, it is hardly likely that new plants will be established, and also because the German make seems to give full satisfaction. However, Gebrueder Pfund are interested in the matter and would like to see a catalogue from America.

I inclose the laws and regulations governing the milk traffic in Dresden, together with an extract from the same in English.

CHAS. L. COLE, *Consul-General.*

DRESDEN, *May 16, 1902.*

REGULATIONS GOVERNING MILK TRAFFIC IN DRESDEN.

[Inclosure in Consul-General Cole's report.]

On July 31, 1900, the following laws in regard to the milk traffic were enforced by the city council in Dresden:

SECTION 1. Cow's milk can only be brought to market if absolutely pure or skimmed. Pure milk is divided into two qualities, the first containing at least 3 per cent of fat, and the second less than 3 per cent. The term "skimmed milk" comprises all milk, even if only partially skimmed, cooked, or sterilized, or treated after the "Pasteur" system.

SEC. 2. Milk changed otherwise than by skimming, cooking, sterilizing, or freezing is excluded from sale. It is particularly prohibited to add water or chemicals, such as bicarbonate of soda, salicylic acid, or the like, for the purpose of preserving the milk.

SEC. 3. The cans or receptacles in which the milk is brought to market must plainly show by mark, which can not be readily removed, the kind or quality of milk contained therein.

SEC. 4. Milk of diseased animals or from places infected with typhoid fever or cholera is excluded from sale.

SEC. 5. All milk brought for sale to Dresden is subject to inspection by officials of the sanitary police department whenever an examination is considered necessary. If found unwholesome or suspicious, the sale is prohibited.

SEC. 6. Transportation, storing, and working, etc., of milk must be done in such a way that it does not affect its wholesomeness or its preservation. Rooms where milk is sold or stored must be dry and airy and are not to be used as sleeping quarters. The receptacles must be kept scrupulously clean, can not be used for other purposes, and should not be of zinc. Persons affected with contagious diseases are not permitted to handle milk.

SEC. 7. All milk brought to market as so-called "sanitary milk," "infant's milk," "cure milk," or under similar names, can only be sold upon permit issued by the local authorities. The cows supplying this superior milk must be absolutely sound and kept under the supervision of a district physician. They must be kept in special stables, and great care must be observed in the selection of the food. The proprietors of so-called "milk-cure" establishments must be experienced men and must be able to prove their efficiency to the authorities.

SEC. 9. Other kinds of milk, such as goat's, sheep's, and donkey's milk, must be designated as such.

SEC. 10. Violation of these regulations is punishable by fine up to 150 marks ($35.70) or imprisonment.

GLAUCHAU.

CREAMERIES AND OUTPUT.

I find but one creamery in my district, the same being located at Kurfangen, about 15 miles from Glauchau.

The output of the creamery referred to is about 1,000 quarts per day. The consumption for the city of Glauchau, of about 25,000 inhabitants, is estimated at about 6,000 quarts. It is impossible to obtain any reliable estimate of the consumption of the entire district, as all the cities, towns, and villages are supplied directly by the small farmers.

PROSPECTS FOR NEW ENTERPRISES.

Prospects for new enterprises in this line are not encouraging, although there is no doubt in my mind but that a well-equipped creamery, located in the vicinity of Zwickau, the largest city in this district, with up-to-date American methods, could be made profitable.

Small hand apparatus, such as is used by the ordinary farmer, costs from $70 to $120. Large ones, according to capacity, cost from $175 to $225.

The smaller machines are made in Niederwürschwitz, Germany; the larger are imported from Denmark.

Conditions existing here and the size of the consular district present little or no encouragement for the opening of agencies for the distribution of creamery machinery or for the establishing of plants for the manufacture of same.

E. A. Creevey, *Consul.*

Glauchau, *June 13, 1902.*

GRAND DUCHY OF OLDENBURG.

CREAMERIES AND OUTPUT.

There are at present 44 creameries in operation and 2 under construction in the Grand Duchy of Oldenburg, a province noted for its agricultural enterprises and for its extensive commerce in farm products. Of these 44 concerns, 40 are stock companies and 4 are worked on the cooperative plan.

Naturally, the main production of these creameries is butter, the output being some 11,800 tons of 2,204.6 pounds per annum.

GOVERNMENT ENCOURAGEMENT.

The grand ducal government encourages these enterprises only in an indirect way, by using all means of securing information which can prove valuable to the furthering and perfecting of this branch of industry.

MACHINERY IN USE.

The machinery used in the creameries is, without exception, bought from German manufactories, especially from the Bergedorfer Eisenwerk, Ahlborn, in Hildesheim, and from Karlshuette, in Rendsburg.

Henry W. Diederich, *Consul.*

Bremen, *July 7, 1902.*

HAMBURG.

There are in Germany, as far as can be calculated, about 6,375 creameries and dairies, which are distributed as follows:

Brandenburg and Pomerania	1,400
East and West Prussia, Posen, Silesia	1,410
Sleswick-Holstein, Hanover, Hessen-Nassau, Westphalia, Rhineland, Mecklenburg, Oldenburg, and Hanse	2,090
Province and Kingdom of Saxony, Thuringia, and Brunswick	700
Bavaria, Baden, Wurttemberg, Hessen, and Alsace-Lorraine	775

Besides these, there are about 940 dairies, which are operated by steam power.

There are in the vicinity of Hamburg about 100 to 125 creameries and cooperative creameries, the exact number not being known, nor am I able to state what their production amounts to. During this and the next year, a number of new cooperative dairies (Genossenschafts-Meiereien) will be put in operation.

UNITED STATES MACHINES.

There are a few dairy machines imported from the United States, but from the information I am able to gain, German machines are preferred for creamery purposes.

HUGH PITCAIRN, *Consul.*

HAMBURG, *August 11, 1902.*

HANOVER.

The number of dairies of more or less importance in the province of Hanover is about 270. The larger ones have a capacity of 20,000 quarts or more of milk per day, while some of the smaller ones do not dispose of more than 1,000 quarts.

No exact statement can be made as to the consumption of milk; it has been estimated, however, that the average creamery uses 4,000 quarts per day.

The creameries are, for the most part, undertakings of farmers who have combined for their common interests to form cooperative registered companies.

In the province of Hanover the dairies are organized into a union (Genossenschaftsverbande). This association employs agents to obtain and instruct new members.

MACHINERY.

Many of the owners of the larger farms or estates are now installing handpower centrifrugal machines. One of the larger type of these machines, with a capacity of 2,000 quarts per hour, costs from 1,000 to 1,500 marks ($238 to $357).

The profits earned by the cooperative societies are, generally speaking, high; at any rate higher than if the farmers worked the milk in their individual dairies without centrifrugal machines.

Some creamery machinery has been imported into this district from Denmark and the United States. Most of the machinery, however, comes from German factories.

JAY WHITE, *Consul.*

HANOVER, *September 24, 1902.*

LIST OF CREAMERIES IN HANOVER DISTRICT.

Molkerei Adenstedt, Adenstedt, Hanover.
Molkerei-Genossenschaft Affinghausen, Affinghausen, Han.
Molkerei Mann & Friedeborn, Ahlten, Han.
Molkerei H. Brockstedt, Ahmstorf bei Lehrte, Han.
Molkerei-Genossenschaft Ahnsbeck-Helmerkamp, Ahnsbeck, Han.
Molkerei Ahstedt-Garmissen, Ahstedt, Han.
Molkerei Alfeld, Alfeld, Han.
Molkerei Algermissen, Algermissen, Han.
Central-Molkerei Aligse, Aligse, Han.
Molkerei-Genossenschaft Allerbüttel-Callerbach, Allerbüttel, Han.
Molkerei Amelsen, Amelsen, Han.
Molkerei Andorf, Andorf, Han.
Molkerei-Genossenschaft Ankum, Ankum, Han.
Molkerei-Genossenschaft Apensen, Apensen, Han.
Molkerei Aschendorf, Aschendorf, Han.
Molkerei-Genossenschaft Asendorf, Asendorf bei Hoya, Han.
Molkerei-Genossenschaft Baddeckenstedt, Baddeckenstedt, Han.
Molkerei Barterode, Barterode bei Göttingen, Han.
Molkerei-Genossenschaft Bassum, Bassum, Han.
Molkerei Bederkesa, Bederkesa, Han.
General-Molkerei Beinum, Beinum bei Hildesheim.
Molkerei Bekum-Stedum, Bekum bei Hildesheim.
Molkerei Bergen, Bergen bei Celle, Han.
Molkerei Bergen, Bergen bei Lüchow, Han.
Molkerei Berka, Berka bei Göttingen, Han.
Molkerei Evermann, Betheln bei Gronau, Han.
Molkerei-Genossenschaft Bevensen, Bevensen, Han.
Molkerei Bevenstedt, Bevenstedt, Han.
Molkerei-Genossenschaft Bierbergen, Bierbergen, Han.
Molkerei Mann & Friedeborn, Bilm, Han.
Molkerei von Zwehl, Bilshausen bei Göttingen, Han.
Molkerei-Genossenschaft Bippen, Bippen, Han.
Molkerei Bockel, Bockel, Han.
Central-Molkerei von Ambergau, Bockenem, Han.
Molkerei Bodenfelde, Bodenfelde, Han.
Molkerei Vahrmeyer & Kruse, Bramsche, Han.
Molkerei Fr. Ehlers, Bredenbeck, Han.
Molkerei W. Waespe, Bredenbeck, Han.
Molkerei-Genossenschaft Brockel, Brockel, Han.
Dampfmolkerei Brome, Brome, Han.
Molkerei Brüggen, Brüggen, Han.
Molkerei-Genossenschaft Bülkau, Bülkau, Han.
General-Molkerei Bültum, Bültum, Han.

Molkerei Burgdorf, Burgdorf, Han.
Molkerei O. Spöttel, Burgdorf bei Goslar, Han.
Molkerei Bardenwerger, Celle, Han.
Molkerei-Genossenschaft Dahlenburg, Dahlenburg, Han.
Molkerei-Genossenschaft Dannenberg, Dannenberg, Han.
Molkerei-Genossenschaft Dassel, Dassel, Han.
Molkerei Dankershausen, Dankershausen, Han.
Dingelber Molkerei, Dingelber, Han.
Molkerei-Genossenschaft Dinklar, Dinklar, Han.
Molkerei Döhren bei Melle, Han.
Molkerei auf Aktien, Dörpen, Han.
Molkerei Dorum, Dorum, Han.
Molkerei Tasch, Duderstadt, Han.
Molkerei Eboldshausen, Eboldshausen, Han.
Molkerei Echte, Echte, Han.
Molkerei Bartels, Hickeloh, Han.
Molkerei Eimbeckhausen, Eimbeckhausen, Han.
Central-Molkerei, Einbeck, Han.
Genossenschafts-Molkerei, Einbeck, Han.
Molkerei Martens, Eldagsen, Han.
Molkerei-Genossenschaft Elvershausen, Elvershausen, Han.
Central-Molkerei, Emmerke bei Hildesheim, Han.
Molkerei Brandt, Ebstorf bei Lüneburg, Han.
Dampfmolkerei Essern, Essern, Han.
Molkerei-Genossenschaft Fischerhude, Fischerhude, Han.
Molkerei Tebbenhoff, Fürstenau, Han.
Molkerei Gadenstedt, Gadenstedt, Han.
Molkerei-Genossenschaft Garlstorf, Garlstorf, Han.
Molkerei Gersten, Gersten, Han.
Genossenschafts-Molkerei Mann & Friedeborn, Gestorf, Han.
Molkerei Gifhorn, Gifhorn, Han.
Molkerei Wolf, Giften, Han.
Molkerei-Genossenschaft Gleidingen, Han.
Molkerei-Genossenschaft Gödringen, Han.
Molkerei Gronau, Gronau, Han.
Molkerei-Genossenschaft Gr.-Burgwedel, Gross-Burgwedel, Han.
Molkerei-Genossenschaft Gr.-Döhren bei Goslar, Han.
Molkerei Gross-Düngen, Gross-Düngen, Han.
Molkerei Ramm & Co., Gross-Elbe, Han.
Dampfmolkerei-Genossenschaft Gr.-Flöthe, Gross-Flöthe, Han.
Molkerei Gross-Lafferde, Gross-Lafferde, Han.
Molkerei-Genossenschaft Gross-Ippener, Gross-Ippener, Han.
Molkerei-Genossenschaft Gross-Sottrum, Sottrum, Han.
Molkerei-Genossenschaft Hameln, Hameln, Han.
Molkerei-Genossenschaft Hankensbüttel, Hankensbüttel, Han.

Molkerei von E. Beissner, Hanover, Hildesheimerstrasse 209.
Molkerei Carl Beuermann, Hanover, Heinrichstrasse 13.
Central-Molkerei Hanover A.-G., Hanover, am Cleverthor 1.
Molkerei von R. Hornack, Hanover, Ludwigstrasse 4.
Molkerei von M. Redeke, Hanover, Braunschweigerstrasse 7 A.
Molkerei Hardegsen, Hardegsen, Han.
Molkerei-Genossenschaft Harpstedt, Harpstedt, Han.
Molkerei Harriehausen, Harriehausen bei Göttingen, Han.
Meierei Harsefeld, Harsefeld, Han.
Molkerei Harsum, Harsum bei Hildesheim.
Molkerei Hary, Hary, Han.
Molkerei Hattorf, Hattorf, Han.
Molkerei Carl Ramm, Haverlah bei Goslar.
Molkerei Heiligendorf, Heiligendorf, Han.
Molkerei Heinde-Listringen, Heinde, Han.
Lehstedter Molkerei, Heinde, Han.
Genossenschafts-Molkerei Hemslingen, Hemslingen, Han.
Molkerei H. Henze, Herbershausen, Han.
Molkerei Hildesheim, Mann & Friedeborn, Hildesheim, Han.
Molkerei-Genossenschaft Himbergen, Himbergen, Han.
Molkerei-Genossenschaft Himmelpforten, Himmelpforten, Han.
Molkerei Hohen-Eggelsen, Hohen-Eggelsen, Han.
Central-Molkerei Hohenhameln, Hohenhameln, Han.
Holler Molkerei, Holle, Han.
Molkerei Hömersum, Hömersum, Han.
Central-Molkerei Loccum, Loccum, Han.
Molkerei Bachmann, Huddestorf, Han.
Molkerei Jeinsen, Jeinsen, Han.
Dampfmolkerei Isenbüttel, Isenbüttel, Han.
Molkerei-Genossenschaft Kalberlah, Kalberlah, Han.
Molkerei Katlenburg, Katlenburg, Han.
Molkerei-Genossenschaft Kirchohsen, Kirchohsen, Han.
Molkerei Sindram, Klauen, Han.
Molkerei-Genossenschaft Klein-Döhren bei Goslar, Han.
Molkerei Klein-Fredenbeck, Kl.-Fredenbeck, Han.
Molkerei Kl.-Mahner, Kl.-Mahner, Han.
Molkerei-Genossenschaft Klenze, Klenze, Han.
Gemeinschaftliche Molkerei, Kniestedt, Han.
Molkerei-Genossenschaft Holtorf, Kolnrade, Han.
Molkerei-Genossenschaft Königsdahlum, Königsdahlum, Han.
Molkerei Koppenbrügge, Koppenbrügge, Han.
Molkerei-Genossenschaft Riemsloh, Krukum bei Melle, Han.
Molkerei Aug. Bollmeier, Landolfehausen, Han.
Molkerei-Genossenschaft Langlingen, Langlingen, Han.
Molkerei Lauenau, Lauenau, Han.

Molkerei Bad Lauterberg, Lauterberg, Han.
Molkerei Lechstedt, Lechstedt, Han.
Molkerei-Genossenschaft Leese, Leesen bei Verden, Han.
Molkerei Lengerich, Lengerich, Han.
Molkerei Lingen, Lingen, Han.
Central-Molkerei Lüneburg, Lüneburg, Han.
Molkerei-Genossenschaft Lüthorst, Lüthorst, Han.
Molkerei Mackensen, Mackensen, Han.
Molkerei-Genossenschaft Markoldendorf, Markoldendorf, Han.
Molkerei Meinersen, Meinersen, Han.
Molkerei Pull & Schulte, Melle, Han.
Molkerei-Genossenschaft Menslage, Menslage, Han.
Molkerei Moringen, Moringen, Han.
Molkerei-Genossenschaft Müden, Müden, Han.
Molkerei Mulsum, Mulsum, Han.
Molkerei Neuenkirchen, Neuenkirchen bei Lüneburg, Han.
Molkerei Neuhaus, Neuhaus a. d. Elbe, Han.
Molkerei Niedern-Jesa, Niedernjesa, Han.
Molkerei Nörten, Nörten, Han.
Meierei vereinigter Landwirte, Nortrup-Loxten, Han.
Molkerei-Genossenschaft Obern-Jesa, Obernjesa, Han.
Molkerei J. Kapp, Oberscheden, Han.
Genossenschafts-Molkerei Oedelum, Oedelum, Han.
Molkerei K. Mann, Gros-Oldendorf, Han.
Molkerei-Genossenschaft Oldendorf bei Melle, Han.
Molkerei-Genossenschaft Oldenrode, Oldenrode, Han.
Molkerei Osterode, Osterode, Han.
Molkerei Oyten, Oyten, Han.
Molkerei W. & G. Sommer, Pattensen a. d. Leine bei Hanover.
Molkerei Chr. Ravens, Pattensen bei Winsen, Han.
Dampfmolkerei Peine, Peine, Han.
Molkerei-Genossenschaft Pevestorf, Pevestorf, Han.
Molkerei Pöhlde, Pöhlde, Han.
Molkerei-Genossenschaft Rautenberg, Rautenberg, Han.
Molkerei Niemann, Rehden, Han.
Molkerei-Genossenschaft Rethem a. d. Aller, Han.
Molkerei-Genossenschaft Rosche, Rosche, Han.
Molkerei Th. Mann, Rössing, Han.
Molkerei-Genossenschaft Salzderhelden, Salzderhelden, Han.
Molkerei-Genossenschaft Scheessel, Scheessel, Han.
Molkerei, A. Raymann, Schladen, Han.
Molkerei-Genossenschaft, Schmedenstedt, Han.
Molkerei Schnega, Schnega, Han.
Molkerei Schoningen, Schoningen, Han.
Molkerei C. Pevestof, Schulenburg, Han.

Molkerei Schwarme bei, Schwarme Hoya, Han.
Molkerei L. Kraatz, Schwarmstedt, Han.
Molkerei Schwiegershausen, Schwiegershausen, Han.
Molkerei Sebexen, Sebexen, Han.
Molkerei-Genossenschaft Sibbesse, Sibbesse, Han.
Molkerei-Genossenschaft Siedenburg, Siedenburg, Han.
Söhlder Molkerei, Söhlde, Han.
Molkerei-Genossenschaft Soltau, Soltau, Han.
Molkerei C. Ressmeyer, Sossmar, Han.
Molkerei Sottrum, Sottrum, Han.
Molkerei Steyerberg, Steyerberg, Han.
Molkerei-Genossenschaft Suhlendorf, Suhlendorf, Han.
Molkerei, Gebr. Windels, Sulingen, Han.
Centralmolkerei Thüste, Thüste, Han.
Meierei Tostedt, Tostedt, Han.
Meierei Diethelm, Tündern, Han.
Molkerei-Genossenschaft Uelzen, Uelzen, Han.
Molkerei Harms, Ummeln, Han.
Molkerei-Genossenschaft Upen, Upen, Han.
Molkerei-Genossenschaft Uslar, Uslar, Han.
Molkerei E. Meyer, Uetze, Han.
Molkerei A. Bost, Vahlbruch, Han.
Molkerei, J. Deichmann, Vienenburg, Han.
Molkerei Julius Wettstein, Vöhrum, Han.
Centralmolkerei Völksen, Han.
Molkerei Voltlage, Voltlage, Han.
Molkerei Wallensen, Wallensen, Han.
Molkerei Walsrode, Walsrode, Han.
Molkerei-Genossenschaft, Wathlingen, Wathlingen, Han.
Molkerei-Genossenschaft Wehmingen, Wehmingen, Han.
Molkerei-Genossenschaft Wehre, Wehre, Han.
Molkerei-Genossenschaft Westfeld, Westfeld, Han.
Molkerei Wettrup, Wettrup, Han.
Molkerei Wiedensahl, Wiedensahl, Han.
Molkerei E. Soletes, Willershausen, Han.
Molkerei-Genossenschaft Winsen, Winsen a. d. Luhe, Han.
Molkerei H. Hermanns, Winzlar, Han.
Wirringer Molkerei, Wirringen, Han.
Molkerei-Genossenschaft Wehmingen, Wehmingen, Han.
Molkerei-Genossenschaft Wittorf, Wittorf, Han.
Wöhler Molkerei, Wöhle, Han.
Molkerei Woltorf, Woltorf, Han.
Molkerei Wörpedorf, Wörpedorf, Han.
Molkerei G. Beyer, Wulften, Han.
Molkerei Wunstorf, Wunstorf, Han.

Molkerei-Genossenschaft Zasenbeck, Zasenbeck, Han.
Molkerei-Genossenschaft Zeven, Zeven, Han.
Alverdisser Molkerei-Verein, Alverdissen, Lippe.
Molkerei-Genossenschaft Blomberg, Lippe.
Molkerei-Genossenschaft Detmold, Lippe.
Molkerei Heiligenkirchen, Heiligenkirchen, Lippe.
Molkerei Horn, Horn, Lippe.
Molkerei Lage, Lage, Lippe.
Lemgoer Molkerei-Genossenschaft, Lemgo, Lippe.
Genossenschaftsmolkerei Arminius, Wulfer-Bexten, Lippe.
Central-Molkerei Bückeburg, Bückeburg, Lippe.
Genossenschaftsmolkerei Altenhagen-Hagenburg, Hagenburg, Lippe.
Centralmolkerei Lindhorst, Lippe.
Fürstliche Molkerei, Lauenhagen, Lippe.
Molkerei Nordsehl, Nordsehl, Lippe.
Molkerei Heine, Stadthagen, Lippe.

HESSE-NASSAU.

CREAMERIES AND OUTPUT.

The number of cooperative creameries in the province of Hesse-Nassau, forming the largest part of the consular district of Frankfort-on-the-Main, is, as far as I could learn, 37, of which some are quite extensive, working with steam power.

Of creameries owned by individuals, there are 3.

The approximate output and consumption I am unable to give.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for new enterprises in this line at the present time in this district do not appear good, as business in general is very much depressed.

GOVERNMENT ENCOURAGEMENT.

I can not learn that any special encouragement is given to this industry by the government, except that the creameries do not have to pay the license fee paid by other business enterprises.

MACHINERY IN USE.

Some centrifugal machines, separators, and other dairy machinery are imported from Sweden, but the greater part of all implements and machinery used is of German manufacture.

INTRODUCTION OF AMERICAN MACHINERY.

Frankfort-on-the-Main would be an excellent place, on account of its central location, for the distribution of creamery machinery; so would Berlin, Hamburg, Bremen, Cologne, Leipzig, Mannheim, Strassburg, Freiburg, Munich, and Nuremberg. Should our manufacturers of such machinery believe they could successfully compete with German and Swedish manufacturers, it would be advisable to exhibit their goods at the German agricultural exposition which annually takes place, mostly in the month of June, at some central point in Germany. That of last year was held at Frankfort; this year at Mannheim. The place for 1903 has not yet been fixed.

The sending of an expert, speaking German, would be the most practical plan. He would soon, after looking the field over, be able to judge whether trade could be expected. If he can demonstrate to the German consumers that the American-made articles are better or cheaper, these goods will find a market, just as others do when earnest, intelligent efforts are made.

The success of American manufacturers of agricultural implements furnishes an illustration, and is mainly due to the fact that intelligent agents were sent over, who at the agricultural fairs exhibited their goods and demonstrated their points of superiority over competitors.

RICHARD GUENTHER, *Consul-General.*

FRANKFORT, *June 12, 1902.*

LEIPZIG.

CREAMERIES AND OUTPUT.

There is one large creamery located in this city—namely, the Leipziger Molkerzigenossenschaft, a limited-liability company—which consumes from 7,000 to 8,000 quarts of milk per day; about 30 firms which use from 500 to 4,000 quarts per day, and a number of small firms which do not consume more than 300 quarts per day. In addition to these creameries, there are three large ones located in this immediate vicinity, at Zschortau, Böhlen, and Cröbers, which use from 5,000 to 6,000, 4,000 to 5,000, and 4,000 to 4,500 quarts of milk per day, respectively.

The price of unskimmed milk in this market is 13 pfennigs per liter, which would mean, reduced to American measures, that 1.0567 quarts of milk (unskimmed) cost 3.094 cents.

GOVERNMENT ENCOURAGEMENT.

The Government does not give any particular encouragement to the creamery industry, but the local police regulations governing the milk traffic, which have been heretofore reported upon (printed in Consular Reports, No. 242, November, 1900), are very carefully enforced.

MACHINERY IN USE.

The most popular creamery machinery is that which is manufactured at Rendsburg, province of Prussia, and known by the name of "Balance." The Melotte or Holland machines and the Alpha system, or Swiss machines, are also used.

BRAINARD H. WARNER, JR., *Consul.*

LEIPZIG, *July 14, 1902.*

MILK INSPECTION IN LEIPZIG.

[Republished from Consular Reports, No. 242, November, 1900.]

In transmitting to the Department a translation of the new rules and regulations governing the inspection and trade in milk, as adopted by the city council in Leipzig, Consul Warner, under date of July 24, 1900, reports that the old regulations were abolished at the instance of the advisory board of the Saxon agricultural department for the reason, chiefly, that their requirement of 3 per cent of fat in the milk could not always, even with the best intentions on the part of the farmers, be complied with. The present regulations reduce the fat requirement in the milk from 3 per cent to 2.7 per cent.

The amount of fat in milk can be increased by artificial fodder, such as cotton-seed-oil meal, cocoa meal, and other foods containing high percentages of oil; but the milk thus produced could not be used in a raw state. Such milk would be very unhealthy for children and could only be used for butter making, and every mother would be obliged to return to milk containing less fat, but which would be perfectly healthy.

The new standard of 2.7 per cent of fat in milk is the prevailing one throughout Saxony. Of 95 cities and towns, only 59 contain any articles in their regulations concerning the lowest allowable percentage of fat. The following gives the percentages of fat required by these 59 cities: Forty-five, 2.7 per cent; four, 2.6 per cent; three, 2.5 per cent; three, 2.4 per cent; two, 2.8 per cent, and two, 3 per cent.

The rules and regulations governing the milk question in Leipzig cover the appointment of officials, the places of milk inspection, testing the amount of fat in the milk, its specific weight, the milk books of the officials, guarding against irregularities, analyses in chemical laboratory, guarding the public against the sale of unhealthy or adulterated milk, etc., and are too extended and too technical for publication in detail. The part relating to milk for children is, however, given as likely to be of special interest to the officials and philanthropists having the same interest in charge in our towns and cities.

MILK FOR CHILDREN.

Milk for the use of children, infants, invalids, etc., must be full milk one quality, and can only be sold by those dealers who have received special permission from the city council. A person who wishes to keep cows for the purpose of producing milk for children, etc., has to report his intention to the city council and request permission to do so.

The requirements for such permission are as follows:

(1) The applicant must be a reliable person, who has had experience in the milk trade or who has some experienced persons in his employ.

(2) The stables in which cows are to be kept must not only be large enough, but must fulfill the hygienic conditions as well.

(3) Only such cows are allowed to be kept in these stables as give milk for children; each cow must be so marked or branded that it will be impossible to mistake. The council is to be immediately notified whenever any new cow is added to the stable.

(4) All cows must be healthy and show no reaction after the customary injection of tuberculosis lymph. Each cow must receive the lymph injection before being placed in the stable; and at any time thereafter such injection can be repeated, at the discretion of the council.

(5) The sickness of any cow must be immediately reported (by the veterinary surgeon having superintendence of the stable to which it belongs) to the council. Any such cow can be removed from the stable at the discretion of said veterinary.

(6) The cows are to be fed, cleaned, and cared for in a proper way. All food which, in the opinion of the veterinary, is inappropriate, must be dispensed with.

(7) Every person employed in milking, feeding, or otherwise looking after the cows must submit a certificate from a physician certifying that he or she is free from infectious or nauseous diseases (especially tuberculosis). These certificates must be submitted by the proprietor of the establishment to the supervising veterinary at least once in six months.

(8) Stables, cows, and all utensils and cans used in milking, storing, and transporting the milk are to be kept in a scrupulously clean condition.

(9) The well-strained or centrifugally purified milk is to be well cooled and delivered to the consumers as soon as possible. When the milk is not delivered direct to the consumers, but, instead, goes through the hands of milk dealers, it is to be sold only in bottles provided with patent stoppers and closed with the private seal of the producer or insured in a similar manner.

(10) Stables and every establishment in the city of Leipzig are under the control of the district physician; in the suburbs they are under the supervision of an official veterinary surgeon, no matter where the stables or stores may be located.

The veterinary must make an inspection, etc.

Consul Warner adds that cows which give milk for children are not allowed to feed in pastures, but are confined to stables and fed dry food, such as hay, meal, etc.

RHINE-HESSE.

The number of creameries in Rhine-Hesse amounts to about 100. It is impossible to obtain the approximate number for this entire consular district, as the boundary lines between this and the adjacent consular districts are partly imaginary lines intersecting various political sections of the Grand Duchy of Hesse.

For the Grand Duchy of Hesse, with a population of about 1,500,000, statistics show a consumption of milk and cream of about one-half pint per capita per diem.

There seem to be no prospects for new enterprises in this line.

GOVERNMENT AID.

The Hessian government subsidizes corporations formed by dairymen for their mutual protection, but their financial standing is such that it seems they could well do without the subsidy.

This section of Germany is not especially adapted to dairy farming, which is only carried on in a small way for the supply of the cities and towns of the immediate vicinity.

WALTER SCHUMANN, *Consul.*

MAINZ, *September 3, 1902.*

RHINELAND.

CREAMERIES AND OUTPUT.

The creamery industry in Rhineland has been increasing very rapidly during the last ten years, with indications pointing to the installation of many new plants in the future. The rapid increase is due in a great measure to the introduction of an excellent cooperative system, which has proved both profitable and satisfactory to its members.

These cooperative associations employ both hand and power machinery, and nearly all show a constant increase in membership and output; better prices and better quality of product are obtained, the business has proved successful, and its tendency is to encourage breeding more and finer grades of cattle.

The formation of central organizations by many of these associations, for economic purposes only, has proved of great advantage to their business. I have had access to a report made by one of these organizations, dated December, 1901, in which appear the following facts:

The organization contains a membership of 136 associations, of which 13 are new with plants installed during the year; 120 make full reports and show a net surplus of 208,558 marks ($70,492). This, with the skim milk and buttermilk returned, gave results entirely satisfactory. The daily capacity of these factories ranges from 121 liters (127 quarts) of milk, consumed by a small creamery, worked by hand, to 12,981 liters (13,720 quarts) of milk, consumed by one of the largest factories, operated by steam; 6,153,822 pounds of butter were produced, for which the average price obtained was 24 cents per pound. There were delivered during the year, to 121 creameries, 81,996,057 liters (21,661,310 gallons) of milk.

From personal investigation of a large number of creameries operated in this vicinity, I find the business conducted on much the same general lines. The cooperative associations confine their operations principally to butter making; some of the stock companies simply separate the cream, first putting the milk through a pasteurizing process; the separated product is bottled, thus preparing it for convenient transportation to the markets; others manufacture cheese, butter, condensed milk, sterilized milk, in addition to the pasteurizing process.

All indications point to a profitable business and the building of many new factories to supply the increasing demand.

MACHINERY IN USE.

The amount paid out for the purchase of machinery, implements, and supplies for the year was 194,000 marks ($46,172).

The Swedish separator and Danish pasteurizer are the only imported dairy apparatus used to any extent. These machines, because of their superior efficiency, are superseding all other kinds of separators and pasteurizers in use here; although the initial cost is much greater, a plant not supplied with them is the exception. Swiss milk condensers and American butter kneaders are used to some extent. The Gerber method of testing milk is in general use here. This method is known as the "acid test," the largest apparatus permitting of 24 samples of milk being tested simultaneously. Some of the more advanced creameries use the "lactoscope," which permits of 384 samples being tested at the same time.

The vertical churn is used in the power plants. A cool-water milk and cream cooler is also in general use. This apparatus is seldom seen in American plants.

PRICES OF MACHINERY.

The following list contains the prices of various machines, and the capacity of same, found most generally in use in the creamery power plants:

Machine.	Capacity per hour.	Price.
Cool-water cooling apparatus:	*Liters.*[a]	
For fresh milk	1,200	$49.98
For cream	1,200	44.08
Pasteurizing apparatus, complete:		
Danish—		
For milk	4,000	259.42
For cream	1,200	92.82
German—		
For milk	3,600	166.60
For cream	800	57.12
Milk warmer	4,000	104.72
Alfa Laval separator	2,000	404.60
German separator	1,600	273.70
Flensburger separator	1,200	249.90
Milk testing apparatus:		
Gerber method—		
By hand (24 samples simultaneously)		35.46
Turbine-centrifugal (24 samples simultaneously)		33.08
Electro-centrifugal (24 samples simultaneously)		69.97
Lactoscope (384 samples simultaneously)		120.19
Milk sterilizer apparatus:		
120 half-liter bottles		130.90
450 half-liter bottles		285.60
Butter kneaders, complete		$40 to $300

[a] 1 liter=1.0567 quarts.

The Rhineland is an ideal dairy country, the most fertile part of Germany, a cool, moist climate, with no extremes of temperature, well adapted for grazing purposes. Grass grows luxuriantly, remains green the greater part of the year, and large crops of hay are produced. The creamery business is one of the important industries of the land, and this country will always afford an excellent market for first-class dairy apparatus and machinery.

There is one noticeable fact in the business conducted by the cooperative associations. While the members of these associations content themselves with very primitive farm implements and machinery, their creameries are equipped with the very best and latest appliances adapted for the purpose, and the manager is thoroughly prepared for the business by his technical education.

THOMAS R. WALLACE, *Consul.*

CREFELD, *July 21, 1902.*

SAXONY.

As I find it impossible to procure reliable statistics regarding creameries for the consular district of Plauen, I have taken in this report the statistics for the Kingdom of Saxony as given in the "Statistisches Jahrbuch für das Königreich Sachsen" issued in 1902, but only giving the statistics up to the year 1900.

CREAMERIES AND OUTPUT.

There were in 1899, according to the above authority, 17 creameries in the Kingdom of Saxony, with a capital of $306,924.

The members of these 17 associations control 6,917 cows, which gave to the creameries in 1899 18,757,482 quarts of milk.

The average per cow was 2,784 quarts per annum. Of this, the creameries sold 1,688,764 quarts of pure milk and 1,018,460 pounds of butter, returning to their members 2,596,940 quarts of skimmed milk.

The 17 creameries use 32 separators; 22 called "Alfa," 4 "Lavelle," 2 "Balance," and 2 "Tehfeldt."

Of milk testers they have 16—12 "Gerber," 2 "Soxhlet," 1 "Babcock," and 1 grammometer.

It will be understood that these creameries sell but a very small part of the milk and butter that is required by the 4,199,758 people of the Kingdom of Saxony; there are hundreds of local creameries, private concerns, of which there is no statistical mention, which do a large business.

OUTLOOK FOR AMERICAN MACHINERY.

From the foregoing remarks it will be seen that there is a large field, not perhaps in the Kingdom of Saxony, which is much more an industrial center for textiles and machines, but in Sleswick-Holstein, Oldenburg, and North Hanover. In these districts, where the great farms are located and where the best butter in Germany is produced, the American manufacturer of creamery machinery will find his best market.

Proper agents, who understand the language and the manner in which business is done, must canvass the country, and the result will, I have no doubt, be favorable.

The establishment of the creamery business in Saxony is another question. The old system of delivering milk and butter is much in favor here; the large farmer having his more or less well-appointed wagon, the small owner of five or six cows using his wagon drawn by dogs to deliver his milk to his customers. These people say they get more by direct delivery than if they sold to a creamery, this only paying 2 to 2½ cents while they receive from their local customers 3 cents per quart.

The 17 creameries of Saxony are located in the following towns: Herrnhut, Kittlitz, Lehndorf, Löbau, Schönau, Uhyft, Bühlau, Frankenstein, Meissen, Pistowitz, Pretzschendorf, Riesa, Böhlen, Döbeln, Lüptitz, and Mügeln.

If our manufacturers wish to write to these places, or send circulars and catalogues with illustrations, the wording should be in German and not, as is too often the case, in English, which will do absolutely no good.

THOMAS WILLING PETERS, *Consul.*

PLAUEN, *June 25, 1902.*

PRODUCTION AND CONSUMPTION OF MILK IN SAXONY.[a]

The following figures will give a general idea of the production and consumption of milk in the Kingdom of Saxony. No statistics were available for a smaller political unit, and none could be obtained for a later date than 1892 and 1895. The figures here quoted were drawn from the publication of the German Association of Milkmen for 1895. At that time the number of cows in Saxony was estimated at 465,000, and the average yield of milk per cow at 3,000 liters (3,170 quarts). In 1892, when the number of cows was somewhat less, the total production of milk for Saxony was estimated at 816,600,000 liters (862,901,220 quarts) for the year, of which 62,130,000 liters (65,652,771 quarts) were fed to calves and 753,500,000 liters (797,248,449 quarts) consumed in the home or placed upon the market. This would place the per capita consumption at about 210 liters (221.9 quarts) per year. Of this amount, probably 120 liters (126.8 quarts) represent fresh milk, and the balance butter and cheese, so that the people of Saxony used about 453,000,000 liters (478,685,100 quarts) of fresh milk in 1892, and about 300,000,000 liters (317,010,000 quarts) in the form of butter and cheese. On the basis of 15 kilograms (33 pounds) of butter per capita per year, some 55,000,000 kilograms (121,253,000 pounds) of butter are used in Saxony every year. Estimating 25 liters (26.4 quarts) of milk to yield 1 kilogram (2.2 pounds) of butter, we find that the 300,000,000 liters (317,010,000 quarts) of milk annually devoted to butter and cheese making yield some 12,000,000 kilograms (26,455,200 pounds) of butter. Here we face the interesting and significant fact that Saxony annually produces only about one-fifth as much butter as it consumes. The explanation of this is found in the fact that the Kingdom of Saxony is distinctly the industrial center of Germany. The balance of the butter is imported from Bavaria, Holstein, Schlesien, Mecklenburg, and of late years from eastern Prussia.

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[a] From the report of Consul Monaghan of Chemnitz.

The consumption of cheese also greatly exceeds the production. The main variety of cheese made is prepared from skim milk and is known as "Magerkaese," or lean cheese. Cheese containing a large percentage of fat is rare on the market Whey-cheese is also very popular, and large quantities are consumed annually.

SILESIA AND POSEN.

CREAMERIES AND OUTPUT.

There are, in the province of Posen, 50 large dairies, owned by stock companies, and 230 other dairies, comprising some owned by large estates, a number of what are called collective dairies, where the milk is collected from the smaller farmers, and other smaller dairies.

The output of butter in the province of Posen is estimated at between 11,023,000 and 13,227,000 pounds for the year 1899.

In the province of Silesia I have found it impossible to obtain the information desired, with the exception of the fact, which was furnished me by the agricultural department of that province, that in the year 1898 there were about 260 dairies there. Regret was expressed that further information could not be furnished.

GOVERNMENT ENCOURAGEMENT.

While there seems to be no Government provision for the encouragement of dairy interests in the province of Silesia, the province of Posen has a dairy bureau, connected with its agricultural department, for the purpose of investigation and the dissemination of information tending to promote the dairy interests of the province.

MACHINERY IN USE AND PRICES.

It would be difficult to quote the prices on machinery, as it would be too voluminous, owing to the number and diversity of the articles, the prices varying with the dimensions, quality, etc.

In the province of Posen there are 1,250 centrifugal separators worked by hand and 1,015 worked by steam power.

The creamery machinery used in this district is mostly of German manufacture, although a small quantity is brought from Denmark and Sweden.

POINTS FOR DISTRIBUTION.

I should judge that Breslau would be a most excellent point for the distribution of dairy machinery, as it is situated in the middle of one of the largest agricultural and dairy sections of Germany and is the purchasing center for the provinces of Silesia and Posen. There is also an annual agricultural-machinery exhibition here, which would afford a fine field for the exploitation of American creamery machinery, as this fair is visited by almost the entire population of this district who are interested in such matters and makes a very appreciable addition to the population of this city, of already nearly half a million inhabitants, during the exhibition week.

ERNEST A. MAN, *Consul.*

BRESLAU, *June 22, 1902.*

STETTIN.

DAIRY FARMS.

It can not be said that dairy farming in this section of Germany (Pomerania and East and West Prussia) has reached a modern system. Large pastures given up exclusively to the grazing of milch cows; lofty, well-ventilated brick cow stables with cement or wooden floors; modern cooling cellars, and power churns are by no means common. I doubt if there are more than half a dozen such farms in this district. The feed of the cattle, when circumstances permit, consists of grass; otherwise of hay, beet-root tops, potatoes, brewers' grain, refuse of sugar mills, cotton-seed and linseed cakes, etc.

OUTLOOK FOR AMERICAN MACHINERY.

I see no reason why modern American machinery would not sell in this district. The introduction of any new foreign article must be done by degrees. The fitting out of one dairy farm, say in some central location of Sleswick-Holstein, would be a good nucleus; then through illustrated pamphlets the entire German trade should be solicited and agencies established at some of the larger cities, with models and photographic views.

The following statistics will give American manufacturers an idea of the district embraced in this report:

Description.	Pomerania.	East Prussia.	West Prussia.
Population (1900)	1,634,659	1,994,417	1,563,459
Percentage of area given to agriculture	72	73.1	68.5
Percentage of population employed at agriculture	47.6	57.2	54
Number of cows	412,620	504,955	355,482
Number of milch-cow owners	5,328	3,003	4,224
Number of cooperative creameries	111	91	128
Average number of dairies connected with cooperative company	48	33	33
Total amount of milk handled per year (in pounds)	1,600,000,000	2,000,000,000	1,400,000,000
Total amount of milk worked into butter and cheese per year (in pounds)	4,400,000	3,560,000	3,300,000

JOHN E. KEHL, *Consul.*

STETTIN, *May 20, 1902.*

GREECE.[a]

ATHENS.

CREAMERIES AND OUTPUT.

Dairying in this consular district is yet in its infancy, as far as the manufacture of butter from the milk of cows is concerned. Most of the natives still use the milk of the goat and the sheep and the so-called butter made therefrom, as their ancestors have done since the dim ages of the past.

There are no real creameries, cooperative or other, in the district; and the few dairies in existence are yet small. There are about 600 milch cows in Athens and its immediate vicinity, and it is estimated that there are about 4,000 in the district. There are no reports or statistics from which I can glean their number or the real amount and value of their products, and the estimates herein given may not be large enough. Thessaly is the best agricultural section of Greece and has many cows, but it would require several months of time and labor to find out about how many there are there, and the quantity and value of their products.

PROSPECTS FOR NEW ENTERPRISES.

There are three dairies in and around Athens that use machinery, all owned and operated by private individuals, the largest by I. E. Chrysaki, containing a herd of 25 Swiss cows, part of them being imported, pure-blooded animals; the leader of the herd, bearing the name "Philadelphia," having been a prize winner as a milch cow in her native country. Those Swiss cows cost here $154.43 to $202.70 each.

The cows in the other dairies of Athens are all of the Russian breed and cost from $57.91 to $96.52 each. There is a tariff duty of 25 to 70 drachmas ($2 to $5.60) on each cow imported into Greece, according to weight.

As the valley of Attica is green for about two or three months of the year, there is little or no pasturage for cows in it at any season, and the dairymen of Athens have to feed their cows in the stable the year round. Each dairyman delivers milk and butter to his customers daily. No salted butter is made, as the people of this part of the world are not accustomed to and do not like salted butter.

The retail price of cows' milk in Athens varies from 1 to 1.2 drachmas (12½ to 15 cents) per oke (2.84 pounds), according to the season, the highest price being paid from September 15 to January 31. The fresh butter made by the dairymen is sold at from 12 to 16 drachmas ($1.50 to $2) per oke. Some of the butter is daily brought to customers in the city from Tatoi, the King's private country estate, 20 miles distant. Unsalted butter for cooking purposes retails at from 3 to 6 drachmas (37 to 75 cents) per oke. This butter is poorly made and quickly becomes rancid. No unsalted butter remains fresh and sweet many days in the summer heat of Athens.

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[a] Duties: Consul McGinley says that machinery is admitted into Greece free of duty. The duty on butter is $30.88 per 284 pounds and on oleomargarine $11.58 per 284 pounds.

Imported salted butter retails at from 6 to 9.60 drachmas ($0.75 to $1.20) per oke (2.84 pounds). The best of this butter comes from Denmark, in tin cans of different sizes. When a can is first opened the butter is sweet, but does not compare favorably with the best dairy and creamery butter of the United States. Most of the imported butter comes from Denmark and Italy; none from the United States.

It is estimated that 36,500 okes (103,660 pounds) of cows' butter is manufactured in Athens and its immediate vicinity annually, and that 250,000 okes (710,000 pounds) of imported cows' butter is consumed in the city in a like period. It is also estimated that butter made from the milk of goats and sheep is annually consumed in this city to the amount of over 100,000 okes (284,000 pounds).

Large quantities of cheese, of different varieties, are annually made from the milk of goats and sheep and are much relished by the natives, but are usually very unpleasant to the foreigner's taste. More than twice as much cheese as butter is consumed here; considerable of it is exported to countries to which Greeks have emigrated. Greek cheese, valued at $16,622.29, and Greek butter, valued at $343.07, were exported to the United States in 1901.

The following are the principal articles fed to milch cows in the dairies in and near Athens, viz: Hay, clover, oats on the straw, corn fodder, cowpeas, and beans, sugar beets, indian corn, pumpkins, and flaxseed cake. The hay and clover is brought baled from Thessaly. The prices of the articles named per oke, in Athens, are as follows: Hay and clover, 2½ to 3 cents; oats on the straw, 3 to 3¼ cents; cowpeas and beans and indian corn, shelled, 3 to 3¾ cents; sugar beets, 1 to 1½ cents; pumpkins, 1¼ to 1½ cents; flaxseed cake, 6¼ cents.

Corn fodder is bought growing in the field for $3.75 to $5 per stremma (about one-fourth of an acre), the purchaser doing the cutting and carting.

PROSPECTS FOR NEW ENTERPRISES.

As most of the natives believe that goats' milk is more healthy than that of cows, and are averse to innovations in such matters, there are poor prospects for new enterprises in the dairy line in the immediate future.

GOVERNMENT ENCOURAGEMENT.

No aid or encouragement is given to the industry by the Government, except that dairy machinery is admitted to the country free of duty.

MACHINERY IN USE.

The dairy machinery in use in this district has been imported from England and Germany. It consists of cream separators, mostly hand machines, one power separator being in use at Calkis, on the island of Euboea; churns of different styles and sizes; butter mortars, and milk-testing machines. The last named are imported from Germany; the separators, churns, and mortars from England. The prices of the separators and churns are: Hand separators, £9 ($43.80); power separators, £25 ($121.66); churns, £2 ($9.73) to £4 ($19.47).

DANIEL E. McGINLEY, *Consul.*

ATHENS, *June 28, 1902.*

CORFU.

CREAMERIES AND OUTPUT.

The Margaritti creamery establishment at Corfu is the only one in Greece of any importance, and run on a comparatively large and proper commercial basis.

In Mr. Margaritti's creamery, there are consumed every day about 3,500 pints of milk, collected from about 200 different peasants or sellers. This goes to show that there are no large farms in the island; but each family owns 1, 2, or 3 cows; these are mostly of excellent English breeds.

Five or six centers are established, where the carts belonging to the creamery go twice a day to collect the milk from the country round. The tins belong to the establishment, one or two being set aside for each seller.

The milk, as soon as it is brought in, is weighed; the scales used are made purposely for weighing milk and showing the capacity at the same time; before being passed it is submitted to three tests—i. e., the density is learned by the lactodensometer; after that the acidity of the milk is ascertained by the Soxhlet-Henkel apparatus, and, lastly, the percentage of cream is found by Dr. Guber's apparatus.

Only such of the milk as has passed these three tests satisfactorily is accepted; any milk into which water has been put or from which the cream has been taken is rejected.

The milk is immediately placed into refrigerators, and after passing through these for a short time is ready for sale and distribution. This latter is also done by carts belonging to the establishment, to the different houses in town.

In the butter department, creaming is done by cream separators of the systems "Alexandra," and also "Alfa-Laval;" the making of it into butter is done by hand, in churns known under the name of "Ideal," and the whey is withdrawn by special appliances (butter workers). The butter is mostly meant for immediate consumption, but a small quantity is slightly salted and put up into one, two, and three pound tins.

In the cheese department, 1 large double English press is used, and 8 of the Schatzmann system. Different kinds of cheeses are made; cream cheeses are only made in winter. There are about 30 persons employed in Mr. Margaritti's establishment, mostly girls, the larger portion being employed in the cleaning department. This establishment is still in its infancy, and the owner proposes to considerably enlarge his output.

PROSPECTS FOR NEW ENTERPRISES.

There is a small opening for creamery machinery, but certainly not at present for the establishment of a plant for making such machinery.

The pasturage of this island is better adapted for the purpose than that in any other part of Greece in the vicinity of the larger towns, though there is plenty of room for improvement by renewing and sowing a better quality of clover seed; but, unfortunately, the peasantry are very poor and indolent, and the larger proprietors are very loath to sink any money in agriculture, especially in what they look upon as a minor matter. Greece has within the last four or five years turned her attention to agricultural schools and establishments, of which there is one here, which in time will no doubt give more attention to the improvement of fodder in general.

C. E. HANCOCK,
Consular Agent.

CORFU, *June 3, 1902.*

PATRAS.

CREAMERIES AND OUTPUT.

Strictly speaking, there are no creameries in this district except on the island of Corfu, of which mention will be made later. This is due to several facts, not the least of which is the noticeable absence of grazing facilities in most parts of the country. Except among the better classes, there is no desire for cow's milk or for cow's butter, and outside the commercial centers little demand for beef, therefore there is little demand for cows and little to feed them upon. The butter for table use and for cooking purposes is almost wholly made from sheep's milk, and the milk supply is largely from goats. In this city it is possible to buy cow's milk, but the demand is not large, the supply is limited, and the price high. During the winter, fresh unsalted butter is imported for light consumption from Corfu at a cost of about 45 to 50 cents per pound, but during the hot season, which covers more than half the year, it is not to be had. The cheaper grades of butter are imported from Servia, Bulgaria, and Avlona (Epines). A very good quality is imported in tins from Holland, Italy, and Denmark, but at prices above the purchasing power of average consumers.

The consumption, so far as I have been able to obtain statistics, amounts to about 65,000 okes (184,600 pounds) annually, of which scarcely one-tenth is homemade.

GOVERNMENT ENCOURAGEMENT.

No encouragement is given the industry by the Government except a protective duty of $9.92 per 284 pounds, against a retail price of 20 to 30 cents per pound. This makes the cost of butter for general use one of the heavy family expenditures.

PROSPECTS FOR NEW ENTERPRISES.

As to any change which might be effected, there seems to be little opportunity for the opening of creameries or for the introduction of creamery machinery, although the latter is free of duty. The climate throughout large sections of the district is not suited for raising grass, the long, hot, and dry summers practically burning up vegetation of certain kinds. There are many valleys which could be made very prolific, and could be made to support large herds of cattle; but the attendant difficulties make the outlook at present impracticable.

Better facilities are offered by the islands than by the mainland, and especially by the island of Corfu, which supports the only real creamery in Greece. I recommend Corfu and the island lying south of it, Cephalonia, to the further attention of manufacturers, willingly placing my services at the disposal of any who may be inclined to look into conditions and opportunities more specifically.

FRANK W. JACKSON, *Consul.*

PATRA, *August 1, 1900.*

ITALY.

CATANIA.

I regret to say that I can offer no encouragement to manufacturers of dairy machinery for a market in this consular district, there being no creameries in this part of Sicily. This is not a cattle country. Goats driven to the door of the consumer supply the milk used. Table butter comes from northern Italy; little is used in cooking, olive oil taking its place.

ALEXANDER HEINGARTNER,
Consul.

CATANIA, ITALY, *May 20, 1902.*

FLORENCE.

Of the 61 dairies scattered through Florence, the majority are simply milk shops, and none are deserving of special mention.

The butter industry in this district is most limited—although in many places the milk is very rich—for the reason that farmers are not familiar with the modern methods of making butter.

A large dairy farm was established at San Donato in the immediate neighborhood of Florence in the year 1889, by the late Le Roy de Koren, of Chicago, Ill., and proved to be quite successful, the products of pure fresh milk, rich cream, and butter meeting with ready sale. The stock and plant of the establishment cost $6,000, not including the buildings, and the rental of the farm involved an additional outlay of $1,000 per annum. The machinery was of the most approved pattern and of English manufacture.

A similar dairy establishment was started a few years ago by the Marchese Luigi Torrigiani's farm "La Pauna" at Gagliano, 18 miles from Florence in the Mugello Valley. In the same valley, at Lutiano, Signor Guiseppe Maganzi Baldini owns a fine creamery of limited capacity, managed on the Danish system.

At Montipiano, a summer resort, near Prato, fine cream and excellent butter are to be had, but in limited quantity.

PROSPECTS FOR NEW ENTERPRISES.

Every season, some slight improvements are made in the installation of creameries, but there is still an ample field for new enterprises. The fact that nearly all the butter consumed in this city comes from Lombardy and Switzerland proves that the local product is deficient in quantity and also quality.

GOVERNMENT ENCOURAGEMENT.

The encouragement given by the Italian Government to the industry consists in subsidizing the departments of manual schools where the making of cheese is taught, and in the awarding of medals and prizes in occasional competitions for the making of butter. As a rule, the medals and prizes do not exceed $50 in value, and are rather liberally granted.

EDWARD C. CRAMER, *Consul.*

FLORENCE, *June 24, 1902.*

GENOA.

EXPORTS OF BUTTER AND CHEESE.

The statistics published by the chamber of commerce of the city of Genoa show the following exportations of butter and cheese for the three years 1898, 1899, 1900:

Year.	Butter.		Cheese.	
	Pounds.	*Value.*	*Pounds.*	*Value.*
1898	1,250,019	$246,177	4,105,046	$569,682
1899	662,170	139,153	3,758,952	415,823
1900	562,202	122,545	5,020,639	593,263
Total	2,474,391	507,875	12,884,637	1,578,768

Ninety-one per cent of the shipments went to America, but the records of the chamber of commerce do not indicate how much went to North America and how much to South America. They show in rough figures that Genoa exports annually to America about 600,000 pounds of butter, valued at about 11 cents per pound, and that the exports of cheese through Genoa to America amount annually to about 4,000,000 pounds, valued at about, say, 12½ cents per pound.

I use the word "through" and not "from" Genoa, because the tables of declared exports from Genoa to the United States show that the average shipments of cheese invoiced at this consulate are only about $50,000 per annum, or one-tenth of the total exportation, a fact which forces me to conclude that the exports of cheese from Milan, Parma, Piacenza, and Reggio Emilia, as well as from Berne, Lucerne, and Winterthur must pass through this port on the way to the United States and to Brazil and Argentina.

CREAMERIES AND OUTPUT.

In this consular district proper, which includes only the provinces of Genoa and of Porto Maurizio, there are very few creameries, and none of any importance, except those near Chiavari and Santo Stefano, which make a peculiar cheese, dry and piquant, resembling the Edam in color and flavor.

This cheese is exported almost entirely to San Francisco, Cal., and to Buenos Ayres, the Italians who have emigrated to those points from northern Italy seeming to have a special and patriotic relish for this particular kind of cheese. I am convinced that most of the cheese for which invoices are certified at this consulate is manufactured in Parma, Reggio Emilia and Piacenza. It is shipped here and sold to wholesale houses, who determine its ultimate destination according to the seasons of the year and the conditions of foreign markets. The best and highest-priced brand comes from Piacenza, and is known as "Piacentino." This is the favorite here for local consumption, and the demand is always greater than the supply.

All these grades from northern Italy are made of cows' milk, while the cheese from southern Italy is manufactured almost exclusively from sheep's milk.

The total exportation of cheese from Italy in the year 1900 amounted to 16,500,000 lire ($3,184,500), and of butter to 16,300,000 lire ($3,145,500).

The dairy industry within the limits of this consular district may be described as "stationary," and likely to remain so.

All lands available either for cultivation or for pasturage have been in use for centuries, and worked to the fullest extent permitted by the nature of the soil and by the geological formation.

The people who live along the lovely Riviera support themselves on and from the sea rather than from the products of the soil. The natives who do not make a living directly or indirectly from the sea live on foreigners who flock here from all parts of the world, attracted by the climate and by the beauty of the region, which nature has been unable to provide with arable soil, but by way of compensation has given a wealth of sunshine, of fragrance, and of variegated color.

GOVERNMENT ENCOURAGEMENT.

The national government gives no special encouragement to the dairy industry, except a small reduction in the excise tax on the salt used in the business. This reduction, amounting to about 15 cents per 100 pounds of salt, is practically insignificant.

The local taxes or "octroi" on dairy products impress Americans as being excessively high. The municipal duty, "dazio," on the consumption of milk in the city of Genoa yields annually about 400,000 lire ($77,200).

MACHINERY IN USE.

I am informed that no imported machinery is used in the dairy business in Italy. In most establishments, the antiquated methods are maintained, and cheese and butter are made in the good old way, just as they were five centuries ago.

Wherever machinery is used in these establishments, the Italian dairyman prefers the Milanese.

OUTLOOK FOR AMERICAN MACHINERY.

The best points in Italy for an enterprising American house to display or to manufacture machinery for the dairy industry are, in the order named, Milan, Rome, and Leghorn.

BUTTER AND CHEESE PRODUCERS.

The principal producers and exporters of butter and cheese in this part of Italy are, P. Bolzaretti, Corsica; I. Pelagatti, Vedova Chiari, Parma; Modesto Perelli, Parma; Guscetti & Ozzola, Parma; E. Bignami & Co., Codogno; Francesco Ferrari di Antonio, Codogno.

RICHMOND PEARSON, *Consul.*

GENOA, *June 10, 1902.*

NAPLES.

There are no creameries of any size in Naples. Little or no butter is made here, and the product is practically used only in the hotels and restaurants for strangers, and is brought from Sorrento and Milan. In my opinion, there is no opening for creameries in this city, owing to the lack of demand for butter.

A. H. BYINGTON, *Consul.*

NAPLES, *July 15, 1902.*

TURIN.

There are very few creameries in this district, the butter being made by peasants and taken by them to local markets. In fact, I am informed that two-thirds of the butter consumed in this city of over 350,000 people is brought from Milan, Lodi, and other Lombardian localities.

There is some little machinery in this district of American make, also German, and it is likewise made in Italy.

PIETRO CUNEO, *Consul.*

TURIN, *May 14, 1902.*

NETHERLANDS.

CREAMERIES AND OUTPUT.

In 1899, the last year for which statistics are obtainable, the number of creameries in the Netherlands was 829. The following table shows the distribution of the creameries over the eleven provinces, the quantity of milk used, and the butter and cheese made:

Province.	Total creameries.	Quantity of milk made into butter.	Quantity of butter made.	Quantity of cheese made.
		Gallons.	*Pounds.*	*Pounds.*
Groningen	48	6,953,067	2,197,219	904,251
Friesland	117	80,804,556	23,021,324	32,388,512
Drenthe	92	15,182,467	5,145,509	50,310
Overysel	77	15,278,667	5,003,603	613,030
Gelderland	86	14,989,933	5,075,946	104,104
Utrecht	10	1,856,844	546,344	419,373
North Holland	21	2,735,511	899,906	28,950
South Holland	43	5,179,733	1,409,364	1,221,746
Zeeland	17	1,988,333	629,996	14,740
North Brabant	162	14,720,822	4,965,831	288,471
Limburg	156	11,367,888	3,987,498	....
Total, 1899	829	171,057,821	52,831,540	36,033,487
Total, 1898	756	154,042,088	45,647,052	39,290,724
Total, 1897	692	131,028,977	38,871,369	31,719,230

Of the foregoing, the following were cooperative creameries:

Province.	Creameries.	Cooperators.	Milk used.	Butter made.	Cheese made.	Centrifuges.		
						Steam.	Hand power.	Other power.
	No.	*No.*	*Gallons.*	*Pounds.*	*Pounds.*	*No.*	*No.*	*No.*
Groningen	31	1,215	4,233,358	1,387,813	348,550	31	17	....
Friesland	68	3,631	42,538,156	12,359,079	23,609,779	115	22	1
Drenthe	72	4,606	12,245,756	4,190,899	....	45	73	....
Overysel	28	2,546	5,267,378	1,795,402	....	25	24	....
Gelderland	48	4,683	10,737,067	3,696,717	....	42	41	1
Utrecht	2	51	172,045	61,096	....	1	....	....
North Holland	5	124	285,867	89,384	....	....	7	....
South Holland	8	179	942,645	291,084	63,833	4	7	....
Zeeland	12	458	1,665,578	564,010	....	11	5	....
North Brabant	126	5,805	11,402,645	3,840,494	251,570	17	155	....
Limburg	135	5,840	8,962,702	3,075,873	....	2	137	....
Total	535	29,138	98,453,197	31,351,851	24,273,732	293	488	2

Cheese factories in 1899.[a]

Province.	Factories.	Milk used.	Cheese made.
	Number.	*Gallons.*	*Pounds.*
Groningen	3	185,222	171,085
North Holland	64	7,855,778	6,602,988
South Holland	1	(b)	....
North Brabant	2	20,000	19,000
Total, 1899	70	8,061,000	6,793,873
Total, 1898	72	7,909,755	6,774,033
Total, 1897	65	7,556,555	6,528,911

[a] In the North Holland cheese factories, 79,262 pounds of butter was made, and 605 pounds in the North Brabant factories.

[b] No statistics.

Of the foregoing cheese factories, the following were cooperative:

Province.	Factories.	Cooperators.	Milk used.	Cheese made.	Butter made in the cheese factories.
	Number.	*Number.*	*Gallons.*	*Pounds.*	*Pounds.*
Groningen	2	88	141,444	130,617	....
North Holland	38	411	4,704,911	3,979,023	37,906
Total	40	499	4,846,355	4,109,635	37,906

The total of butter and cheese made in the Netherlands in 1899 was:

Made—	Butter.	Cheese.
	Pounds.	*Pounds.*
On farms	68,932,554	110,873,664
In creameries	52,831,540	36,033,487
In cheese factories	79,867	6,793,873
Total	121,843,961	153,701,024
Total, 1898	121,300,799	161,539,017
Total, 1897	107,120,688	142,113,882

Milk centrifugals in use on farms, creameries, and factories.

Province.	Hand power.		Animal power.		Steam power.		Gas, electricity, or petroleum motive power.	
	1898.	1899.	1898.	1899.	1898.	1899.	1898.	1899.
	No.	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*
Groningen	29	30	4	....	49	51	....	....
Friesland	118	116	4	3	181	187	....	1
Drenthe	88	94	....	....	59	63	....	....
Overysel	49	59	1	....	67	75	1	3
Gelderland	83	84	3	3	67	72	8	6
Utrecht	2	6	....	....	15	16	....	....
North Holland	30	42	....	2	17	26	1	1
South Holland	36	33	15	5	60	73	1	1
Zeeland	134	301	....	....	18	16	....	....
North Brabant	277	396	4	6	24	35	1	1
Limburg	426	537	2	11	5	5	....	1
Total	1,272	1,698	33	30	562	621	12	14

Of the creameries and cheese factories, the following number were driven by steam in 1900:

Province.	Creameries and factories.	Boilers.	Steam engines.	Nominal horse-power.
	Number.	*Number.*		
Groningen	38	40	....	401.00
Friesland	98	158	....	2,731.00
Drenthe	43	44	....	388.00
Overysel	55	56	....	620.00
Gelderland	48	50	....	571.00
Utrecht	9	12	....	204.00
North Holland	51	53	....	203.00
South Holland	30	40	....	966.00
Zeeland	12	15	....	139.00
North Brabant	27	29	....	369.00
Limburg	7	7	....	65.00
Total	418	504	....	6,657.00
Total, 1899	390	478	340	2,935.50
Total, 1898	359	441	317	2,633.50
Total, 1897	375	322	240	1,982.25

PROSPECTS FOR NEW ENTERPRISES.

The number of cooperative creameries in the Netherlands is increasing from year to year, and the prospects for new enterprises on a small scale in the dairying districts are very favorable. The small farmers, especially those that keep but a couple of cows and formerly had to dispose of their milk at the nearest city or village at whatever price they could get for it, now take it to the cooperative creamery of which they are members. The butter is extracted from the milk, and the skimmed milk is returned to the farmer for feeding his calves or hogs. As long as there is sufficient demand for Dutch butter, both in the Netherlands and abroad, the creameries will thrive. The exportation of butter from the Netherlands in 1901 amounted to 48,829,000 pounds, against 49,922,400 pounds in 1900 and 45,040,600 pounds in 1899.

GOVERNMENT ENCOURAGEMENT.

Certain provisions in the Netherlands import tariff laws made in favor of the farmers affect the creameries, viz, the provision that all machinery used in the preparation of dairy products may be imported into the Netherlands free of duty, the same as machinery imported for agricultural pursuits.

Cooperative creameries carried on by farmers can work somewhat cheaper than other creameries, owing to the fact that the farmer in the Netherlands is subject to less personal taxation for the labor he employs and the horses and machinery he uses than a manufacturer or other person subject to taxation.

MACHINERY IN USE.

Dairy machinery is imported from Denmark, Sweden, Germany, and Austria. The coolers and centrifugals are mostly made in Denmark, the latter also in Vienna. The separators come mostly from Sweden.

PRICES OF MACHINERY.

It is impossible to state the exact prices of dairy machinery. They vary with every importer and outfitter of dairies and creameries. Danish "Laval" separators can be purchased here at from $280 to $320. Centrifugals can be had at from $100 to $1,000.

DAIRY AND CREAMERY OUTFITTERS.

There are a few firms in the Netherlands which make a specialty of fitting up dairies and creameries. The required machinery they import from different sources and deliver the whole complete at the price agreed upon.

The principal dairy and creamery outfitters are: Boeke & Huydekooper, Groningen; Massee & Sons, Goes; Veth & Co., Dordrecht; De Jonge & Co., Dordrecht; Henri Grasso, S'Hertogenbosch.

POINT FOR DISTRIBUTION.

A prominent creamery owner with whom I had a conversation on the subject was of the opinion that the Netherlands was too small a field for the establishment of a plant for the manufacture of creamery machinery, unless not only the creameries of the Netherlands but also those of surrounding countries would be supplied from it.

Rotterdam, the principal port of the Netherlands, and the port of entry, so to speak, for the German Rhine countries and Switzerland, with excellent river, canal, and railroad facilities to the interior of the Netherlands and the continent of Europe, and situated almost in the heart of a dairying district, would be the proper point in the Netherlands for the distribution of American dairy machinery over central Europe.

In the Netherlands our dairy machinery, if competing in price with that from the other manufacturing countries and if sold on easy terms of payment, would undoubtedly find a good market.

S. Listoe, *Consul.*

Rotterdam, *June 17, 1902.*

SUPPLEMENTARY.

As a supplement to my report of June 17 I submit herewith statistical information on the same subject for the year 1900, recently received from the Netherlands bureau of agriculture.

Creameries in the Netherlands.

Provinces.	Total number of creameries.		Quantity of milk made into butter.		Quantity of butter made.		Quantity of cheese made in the creameries.	
	1899.	1900.	1899.	1900.	1899.	1900.	1899.	1900.
			Imp. galls.	*Imp. galls.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Groningen	48	50	6,953,067	7,131,512	2,197,219	2,275,944	904,251	1,460,571
Friesland	117	127	80,804,556	88,912,777	23,021,324	24,621,676	32,388,512	39,462,848
Drenthe	92	94	15,182,467	16,838,066	5,145,509	5,307,064	50,310	53,099
Overyssel	77	84	15,278,667	17,107,266	5,003,603	5,670,276	613,030	595,320
Gelderland	86	84	14,989,933	17,987,666	5,075,946	6,061,044	104,104	102,245
Utrecht	10	11	1,956,344	2,116,488	546,344	668,985	419,373	381,522
North Holland	21	20	2,735,511	1,720,488	899,906	479,677	28,950	310,290
South Holland	43	47	5,179,733	6,343,844	1,409,364	1,339,329	1,221,746	1,580,414
Zeeland	17	19	1,988,333	2,038,993	629,996	687,867	14,740	6,897
North Braband	162	165	14,720,322	19,255,711	4,965,831	5,899,700	288,471	286,829
Limburg	156	172	11,367,388	11,602,978	3,937,498	3,995,473	....	....
Total	829	873	171,057,821	191,055,729	52,831,540	57,007,035	36,033,487	44,180,035

Cooperative creameries.

Provinces.	Total cooperative creameries.		Number of cooperators.		Milk.		Quantity of butter made in the cooperative creameries.	
	1899.	1900.	1899.	1900.	1899.	1900.	1899.	1900.
					Imp. gals.	*Imp. gals.*	*Pounds.*	*Pounds.*
Groningen	31	36	1,215	1,929	4,233,358	4,811,288	1,387,813	1,595,799
Friesland	68	76	3,631	3,662	42,538,156	44,038,600	12,359,079	12,841,723
Drenthe	72	72	4,606	5,042	12,245,756	13,225,111	4,190,899	4,527,603
Overyssel	28	32	2,546	2,185	5,267,378	6,510,533	1,795,402	2,227,672
Gelderland	48	51	4,683	6,065	10,737,067	1,419,064	3,696,717	4,808,577
Utrecht	2	3	51	219	172,045	966,733	61,096	338,714
North Holland	5	4	124	139	285,867	284,311	89,384	87,034
South Holland	8	10	179	173	942,654	1,219,177	291,084	393,642
Zeeland	12	11	458	420	1,665,578	1,551,467	564,010	533,320
North Brabant	126	130	5,805	6,661	11,402,645	14,201,689	3,840,494	4,742,661
Limburg	135	156	5,840	7,219	8,962,702	10,667,711	3,075,873	3,635,568
Total	535	581	29,138	33,714	98,453,197	98,895,684	31,351,851	35,732,313

Provinces.	Quantity of cheese made in the cooperative creameries.		Number of centrifugals in these creameries.					
			Steam.		Hand power.		Other power.	
	1899.	1900.	1899.	1900.	1899.	1900.	1899.	1900.
	Pounds.	*Pounds.*						
Groningen	348,550	335,078	31	34	17	25	......	......
Friesland	23,609,779	22,564,533	115	126	22	25	1	......
Drenthe	....	53,099	45	62	73	77	......	......
Overyssel	....	....	25	25	24	27	......	1
Gelderland	....	....	42	53	41	41	1	1
Utrecht	....	....	1	6	......	......	......	......
North Holland	....	....	......	......	7	......	......	......
South Holland	63,833	102,788	4	6	7	9	......	......
Zeeland	....	....	11	10	5	5	......	......
North Brabant	251,570	227,429	17	22	155	160	......	......
Limburg	....	....	2	2	137	161	......	1
Total	24,273,732	23,282,927	293	346	488	530	2	3

Cheese factories.

Provinces.	Number of cheese factories.		Milk used.		Quantity of cheese made.		Quantity of butter made in the cheese factories.	
	1899.	1900.	1899.	1900.	1899.	1900.	1899.	1900.
			Imp. gals.	*Imp. gals.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Groningen	3	7	185,222	409,689	171,085	367,101	....	4,039
North Holland	64	65	7,855,778	9,226,244	6,602,988	7,880,453	79,262	113,951
South Holland	1	1	(a)	....	....	....	....	....
North Braband	2	3	20,000	22,222	19,800	22,000	605	638
Total	70	76	8,061,000	9,658,155	6,793,873	8,269,554	79,867	118,628

a No statistics.

Cooperative cheese factories.

Provinces where situated.	Number of factories.		Number of cooperators.		Milk used.		Cheese made.		Butter made in these cheese factories.	
	1899.	1900.	1899.	1900.	1899.	1900.	1899.	1900.	1899.	1900.
					Imp. gals.	*Imp. gals.*	*Pounds.*	*Pounds.*	*Lbs.*	*Lbs.*
Groningen	2	3	88	97	141,444	171,800	130,612	157,216	....	....
North Holland	38	48	411	485	4,704,911	6,803,600	3,979,023	5,887,499	37,906	42,062
Total	40	51	499	582	4,846,355	6,975,400	4,109,635	6,044,715	37,906	42,062

Butter and cheese produced in the Netherlands.

	Butter.		Cheese.	
	1899.	1900.	1899.	1900.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
On farms	68,932,554	65,949,620	110,873,664	113,469,620
In creameries	52,831,540	54,807,036	36,033,487	44,240,035
In cheese factories	79,867	118,628	6,793,024	8,269,554
Total	121,843,961	120,875,284	153,700,175	165,979,209

Milk centrifugals in use on farms, in creameries, and factories.

Provinces.	Hand power.		Animal power.		Steam power.		Gas, electricity, or petroleum motor power.	
	1899.	1900.	1899.	1900.	1899.	1900.	1899.	1900.
Groningen	30	48	....	....	51	48	....	....
Friesland	116	116	3	3	189	210	1	....
Drenthe	94	91	....	....	63	71	....	....
Overyssel	59	73	....	....	75	78	3	3
Gelderland	84	83	3	5	72	78	6	6
Utrecht	6	6	....	....	16	17	....	....
North Holland	42	46	2	2	26	26	1	1
South Holland	33	36	5	6	42	47	1	1
Zeeland	301	430	....	6	15	18	....	....
North Brabant	396	463	6	14	35	39	1	1
Limburg	537	727	11	1	5	7	1	2
Total	1,698	2,119	30	37	590	639	14	14

AMSTERDAM.

CREAMERIES AND OUTPUT.

It is impossible to state the total number of creameries in this district. In nearly every village of the provinces of Friesland and North Holland from three to four cooperative and other creameries, either worked by steam or hand power, can be found.

The daily output of the creameries is from 2,000 to 60,000 liters (2,113 to 63,400 quarts), and it is calculated that the prices made for the milk are from 2 to 2⅗ American cents per liter (1.0567 quarts).

PROSPECTS FOR NEW ENTERPRISES.

There are no prospects for new enterprises in this line, on account of the present decrease in the price of cheese.

GOVERNMENT ENCOURAGEMENT.

The Government has encouraged the industry by the establishment in every province of a Government council of advisers, whose services are at the disposal of the public, free of charge.

Agricultural machinery is admitted free of duty.

MACHINERY IN USE.

The Laval system is nearly everywhere used for separators; they are manufactured by the Laval factory at Stockholm, which has a branch house at New York.

Butter churns are made here at more advantageous prices than when imported, the freight rates from the United States being too high to permit importation here.

POINTS FOR DISTRIBUTION OF MACHINERY.

The best points to establish agencies for the sale of American dairy machinery are: Amsterdam, for the province of North Holland; Leeuwarden, for the province of Friesland, and Utrecht, for the province of Utrecht.

FRANK D. HILL, *Consul*.

AMSTERDAM, *May 15, 1902*.

RUSSIA.

BATUM.

There are no creameries in this district. There is one rather heavy manufacturer of butter and "Swiss," or "Schweitzer," cheese near Tiflis, named Baron Kutchenbach, who has a shop for the sale of his products in Tiflis and can be reached there by mail.

I have no means of obtaining information as to the annual output of this establishment, but it can not be large, from an American point of view, as at least 80 per cent of the butter used in this section comes from south and central Russia and is sold here at less prices than that produced by Kutchenbach.

PROSPECTS FOR NEW ENTERPRISES.

I do not think the prospects for increasing this industry are sufficient to justify any great effort upon the part of manufacturers of American machinery.

James C. Chambers, *Consul.*

Batum, *May 16, 1902.*

ODESSA.

There are no creameries existing, as far as I have been able to ascertain, within the consular district of Odessa. Butter is brought to this city from the north of Russia—that is to say, butter of good quality. On many of the large estates in southern Russia dairies are to be found with American, English, and German machinery. The separator in use is, as a rule, purchased in Sweden.

About 800 tons of a fine quality of Siberian butter is shipped each week from Riga to England. I am informed that this butter is creamery butter.

Thos. E. Heenan, *Consul.*

Odessa, *June 23, 1902.*

SPAIN.

ASTURIAS.

CREAMERIES AND OUTPUT.

This industry in the province of Asturias, as regards production by mechanical appliances, is in its infancy, but shows signs of considerably increasing in the near future, as modern methods are becoming known to the peasantry, and the necessity is felt of improving the breed of cattle, and caring for the pastures.

Cattle from abroad are now being imported to improve the breed, and large tracts of grass lands are beginning to be cultivated under improved methods.

Twelve mechanical creameries are producing butter and cheese of a superior quality, none of which is cooperative.

The approximate output per annum is: Butter, 450 tons; cheese, 280 tons. Consumption: Butter, 3,200 tons; cheese, 4,000 tons.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for new enterprises are good, as the creameries now working are doing well.

The machinery used for butter making is principally imported from Denmark—such as De Laval's separators. A few machines are imported from France. Very few machines for making cheese are imported, and those that are come from Holland.

GOVERNMENT ENCOURAGEMENT.

At the village of Villablino, in the adjoining province of Leon, there is an advanced agricultural college, where two practical and theoretical professors are established, having been trained in France, Switzerland, and Holland, at butter and cheese factories; and one or the other is sent yearly to the countries mentioned to obtain the latest acquaintance with the several advances made in these manufactures. The students are admitted free and are scientifically and practically taught the manufacture of butter and cheese, sterilization of milk, and the best systems of cultivation, etc.

The effects of the college are marked in every direction around the district, and some of the students, after terminating their courses, have formed a company and established in Villajed a butter manufactory upon the latest model, sending their products to Madrid and other important cities. This company also sends one of its partners to France or other advanced countries yearly to report on any improvements. All machinery employed is French.

Another college is being inaugurated in the capital of Leon.

ARTHUR LOVELACE,
Acting Consular Agent.

GIJON, *May 21, 1902.*

BARCELONA.

CREAMERIES AND OUTPUT.

This is not a cattle-rearing district, and hence the establishment of creameries on a large scale has never been attempted. Fodder is scarce and dear, having to be brought from other parts of Spain. Of late years, however, the success achieved by some farmers in a neighboring village, who arranged to establish a creamery for the purpose of supplying this city with better milk than had hitherto been obtainable, prompted others to follow their example, and there are now eight such creameries in the immediate neighborhood of Barcelona, besides innumerable small farms that send in no more than a gallon of milk each, every morning.

The cows are fed on sainfoin and carrots in summer, and in winter on meal cakes and hay. Some creameries give the cows turnips, but the best do not.

Butter is only made when there is a surplus supply of milk, which rarely happens, and practically all the butter consumed has to be imported.

JULIUS G. LAY, *Consul-General.*

BARCELONA, *June 5, 1902.*

GALICIA.

CREAMERIES AND OUTPUT.

There are only 5 small creameries in this district, the total daily output of which is estimated at about 350 kilograms (772 pounds).

Cheese is the sole product, for these people never do their cooking with butter, and only make use of it occasionally as a mere luxury.

MACHINERY IN USE.

The creameries, or cheese-making establishments, are poorly equipped, and whatever machinery they use has been imported from France; but I have no reliable information as to the cost and components thereof.

PROSPECTS FOR NEW ENTERPRISES.

The industry is no way encouraged by the Government; yet, as milk is very abundant in Galicia, I should say that prospects are fairly good for new and well-equipped enterprises in some sections, with agencies in the principal cities, say Corunna, Lugo, Vigo, and Orense.

I hear that, with a view to improving the quality of milk in this region, several parties are considering the importation of milch cows, and also the best kinds of seeds for the amelioration of pasture.

The first outlay for establishing a dairy on a large scale must be considerable, chiefly for the reason that all the pasture grounds are owned by small farmers, who will ask extravagant prices for their respective parcels.

JULIO HARMONY, *Consul.*

CORUNNA, *May 16, 1902.*

MADRID.

There are few, if any, creameries in this consular district, or, in fact, in all Spain. The consumption of butter, cheese, and other dairy products is supplied chiefly by importation, a large part of which comes from Switzerland.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for new enterprises in this line here are exceedingly good. Centuries of careful breeding of bulls for the national pastime of bullfighting have developed a class of cattle in Spain which can compare favorably with that of any other country. A great deal of attention is now being paid to this class of industry and many articles have appeared in the papers on the subject.

Negotiations should be started direct with the large cattle breeders or other people likely to be interested, who should be supplied with catalogues in Spanish or French.

TARIFF ON MACHINERY.

Dairy machines would probably come under the head of "agricultural machinery" in the custom-house. This kind of machinery pays a duty of 12.50 pesetas (about $1.87)[a] per 100 kilos (220.46 pounds). That coming from the United States pays 18 pesetas ($2.70) per 100 kilos, on account of the lack of a commercial treaty.

DEAN R. WOOD,
Vice-Consul.

MADRID, *September 28, 1902.*

MALAGA.

Creameries do not exist at all in Andalusia, and the butter used here is imported chiefly from Denmark, Germany, and France.

The milk in ordinary use is goat's milk and there are no dairies, the goats simply being driven about town and milked at the doors of the consumers.

Incidentally, I may add that the imported butter used here retails at 3 pesetas (about 40 cents) a pound.

Some butter reaches Malaga in the winter months from northern Spain, but the butter mostly in use comes from France, Denmark, and Germany. Incidentally, it may be added that the Spanish butter made from cow's milk in the northern provinces (manteca de vaca) commands the same price as the imported butter, i. e., 3 pesetas a pound.

Goat's milk butter is used to some extent, but is little cheaper than cow's milk.

BENJ. H. RIDGELY, *Consul.*

MALAGA, *May 19, 1902.*

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[a] At present rate of exchange.

VALENCIA.

There are no creameries in this district, nor on the Mediterranean coast of Spain, pasturage being very scarce and the customary dietary of the people requiring but a limited supply of milk products.

Fresh milk, of which there is an increasing consumption, is still treated rather as a medicine than a food, and is prescribed by doctors for lymphatic and delicate children, but so extreme is the want of confidence or fear of adulteration that the cows and goats are paraded through the streets from house to house and the milk drawn in the presence of the prospective consumers.

R. M. BARTLEMAN, *Consul.*

VALENCIA, *May 9, 1902.*

SWEDEN AND NORWAY.

NORWAY.

CREAMERIES AND OUTPUT.

The total number of creameries in Norway is about 650. The approximate consumption of all creameries in the country is about 220,000 gallons daily. The production of butter and cheese in 1901 by all Norwegian creameries was: Butter, 3,500,000 kilograms (7,716,100 pounds); cheese, 4,138,000 kilograms (9,122,635 pounds).

Nearly all the creameries are cooperative, but in some cases they are rented out by the shareholders to a single man or corporation for a fixed sum per year. Most of the Norwegian creameries are up to date, provided with separators and other modern equipments. The yield is partly sold in the English market, at the highest prices there obtainable. Cheese dairies exist in a smaller number around Christiania and Trondhjem, but they have not as yet succeeded in producing a cheese which satisfies the requirements of foreign markets. The production of three milk-condensing factories goes almost entirely to foreign markets.

GOVERNMENT ENCOURAGEMENT.

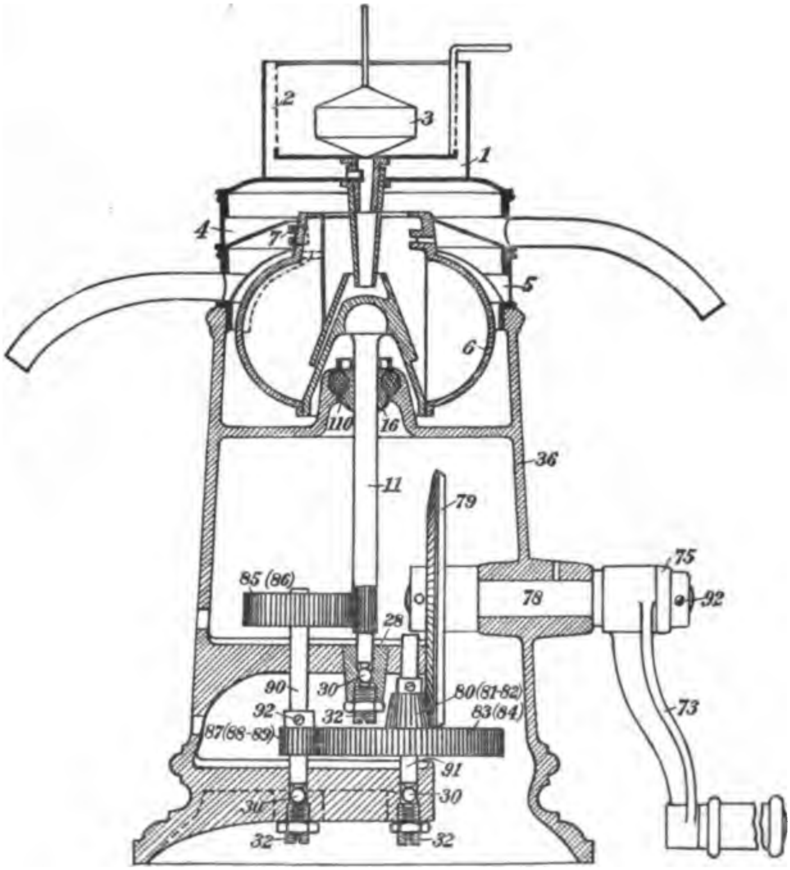
The Government lends considerable support to the creamery industry by maintaining nine creamery schools and one school for cheese making, besides giving every year 8,000 kroner ($2,124) for stipends to people interested in studying the advancement of the creamery industry abroad.

MACHINERY IN USE.

The dairy machinery used in Norway is to an extent of about 25 per cent of domestic make, but the largest part is imported from Sweden and Denmark. In the manufacture of separators, Sweden is considered the leading country. Swedish separators are widely sold in England and other European countries, and quite a number is said to be exported to America.

PRICES OF MACHINES.

I inclose a sectional drawing of the kind of hand separators mostly used in this country. This has a capacity of 500 liters per hour and costs 360 kroner ($96.48).



Hand-Power Separator.

Following are the prices of the different kinds of dairy machinery:

"Alfa" De Laval separators, model 1899. Cord separators, delivering from 700 to 2,000 liters (185 to 528 gallons) per hour; prices, from 575 to 1,200 kroner ($154 to $321.60) (3 sizes). Turbine separators, delivering from 300 to 2,000 liters (79 to 528 gallons) per hour; prices, from 325 to 1,400 kroner ($87 to $375) (5 sizes). Ready for use with transmissions, etc. Packing included.

Apparatus for determining the contents of grease (butyrometer); prices, from 75 to 275 kroner ($20 to $73.70).

Hand separators: "Princess" (6 sizes), delivering from 75 to 450 liters (19.8 to 118 gallons) per hour; for cash, from 110 to 400 kroner ($29.48 to $107.20); per three months, from 115 to 410 kroner ($30.82 to $109.88); per six months, from 120 to 420 kroner ($32.16 to $112.56). "Victoria" (4 sizes), delivering from 60 to 160 liters (14.3 to 38 gallons) per hour; for cash, from 100 to 175 kroner ($26.80 to $46.90); per three months, from 105 to 180 kroner ($28.14 to $48.24); per six months, from 110 to 185 kroner ($29.48 to $49.58). All delivered in Christiania.

Hand separators, skimming 500 liters (132 gallons) per hour, 360 kroner ($96.48).

Hand separators, skimming 275 liters (72 gallons) per hour, 270 kroner ($72.36).

Machine separators, skimming 700 liters (184 gallons) per hour, 380 kroner ($101.84).

Skimmed-milk pasteurs, 750 to 7,500 liters (198 to 1,980 gallons), 368 to 1,045 kroner ($98.62 to $280).

Fresh-milk pasteurs, from 350 to 2,450 liters (92 to 647 gallons), 342 to 683 kroner ($91.65 to $183).

Cream pasteurs, 350 to 1,750 liters (92 to 412 gallons), 341 to 557 kroner ($91.38 to $149.27).

Fore warmers, from 1,000 to 7,000 liters (264 to 1,844 gallons), 341 to 683 kroner ($91.38 to $183).

Cooling apparatus for pasteurized milk, 221 to 998 kroner ($59.22 to $267.46).

Cooling apparatus for pasteurized cream, 79 to 578 kroner ($21.17 to $160.26).

Oaken cream barrels, 200 and 300 liters (52 to 79 gallons), 35 and 42 kroner ($9.38 to $11.25).

Cheese receptacles, galvanized copper, 535 to 1,900 liters (141 to 502 gallons), 131 to 394 kroner ($35.10 to $105.59).

Cheese presses, single (for 2), 86 kroner ($23.04); double (for 4), 158 kroner ($42.34).

Butter-cooling boxes, 100 to 200 liters (26 to 52 gallons), 83 to 138 kroner ($22.24 to $36.98).

Mixing machines, 1-meter (39.37 inches) table, 220 kroner ($58.96); 1.57-meter (51.8 inches) table, 440 kroner ($117.92).

Milk pumps for 22.5 and 40 hectoliters (594 to 1,056 gallons) per hour, 178 to 210 kroner ($47.70 to $50).

Churns for horsepower, 175 to 400 liters (46 to 105.3 gallons), 77 to 132 kroner ($20.62 to $35.38).

Churns for other power, from 65 to 560 kroner ($17.40 to $150.08).

OUTLOOK FOR AMERICAN MACHINERY.

The outlook for selling American machinery of this kind can not be said to be very favorable, as the most important dairy equipments are either of domestic or Swedish make. If, however, American manufacturers in this line have anything to offer on account of lower price or on account of possessing some superior merit, it would be proper to have someone to represent them in Norway. With an able man at Christiania to look after their interests, the whole country could be properly taken care of. I do not believe that Norway under any circumstances would offer a market large enough to justify establishing factories for the manufacture of creamery machinery.

CREAMERY EXHIBIT.

That the Norwegian creameries are quite far advanced and that much interest is taken in the dairy industry is demonstrated at the national agricultural exhibition now held at Trondhjem, where butter and cheese are being treated according to a new scientific method, by which the product keeps much longer. The butter is exhibited in closed show cases having glass sides, and the cheese is put on closed shelves with movable glass fronts. Below and in between the pieces of butter and cheese are laid cold-water pipes, thus keeping the temperature suitably low. The cooling apparatus is operated by electricity. Three modern creameries will be kept running all the time at the exhibition. Two of them are common separator dairies, where the milk is skimmed and the cream churned before the eyes of the public. The third and the most interesting is a so-called radiator dairy, where the milk, through one machine and in a single handling, comes out as the finished product—butter.

A NEW MILK-PRESERVATION METHOD.

A Dane by the name of Fjeldstrup has patented a method for condensing milk, by which it may be kept fresh and wholesome for a long period. After five years milk handled by his method is said to have remained palatable.

DEALERS IN MACHINERY.

Of Christiania dealers in creamery machinery I will name Heyerdahl & Co., Stenersgaden 1; A/S Andrew Hollingworth & Co.'s Oplag, Stenersgaden 8; Heimdal Maskinforretning, Storgaden 28; Kampens Mekaniske Verksted, Brinkensgade 5; H. L. Grue, Jernbanetorvet 11; E. C. Due, Raadhusgaden 10; S. H. Lundh & Co., Jernbanetorvet 4 b.

HENRY BORDEWICH,
Consul-General.

CHRISTIANIA, *June 12, 1902.*

BERGEN.

One large and five small creameries existed for some time in the Söndre Bergenhuus County, but they were closed on account of insufficient milk supply, this not being an agricultural section.

CREAMERIES IN STAVANGER.

The number of creameries, with output and consumption, in the district of Stavanger has been:

1901.	Number of creameries.	Received milk.		Value paid for same.		Per kilo.	Per pound.
		Kilos.	*Pounds.*	*Kroner.*		*Öre.*	*Cents.*
Stavanger Amt	26	14,900,100	30,648,760	1,365,500	$365,954	9.16	1.19
Söndre Bergenhuus Amt	66	8,992,000	19,823,763	710,100	190,306	7.81	.95
Total	92	23,892,100	50,472,523	2,075,600	556,260	8.69	1.10

It is probable that there will be no large increase during the next few years.

Most of the creameries are formed through cooperation of the farmers and have no direct support from the Government; but, on the other hand, this gives assistance to dairy schools, partly in the form of compensation to the pupils for board, partly in salaries for teachers.

The butter produced is sold in Norway and England, principally at Newcastle. Cheese is generally sold within the country.

In the creameries enumerated below butter is made for export to England, and more or less cheese is also made.

	Graduated dairymen.	Selling butter to England.	Fat cheese.	Nögel cheese.	Old cheese.	Pult cheese.
Stavanger Amt	12	7	3	8	....	1
Söndre Bergenhuus Amt	8	32	....	2	16	....
Total	20	39	3	10	16	1

MACHINERY.

Almost all the creamery machines are imported from Sweden and Denmark, and the price of a complete set varies between 2,000 to 3,000 kroner ($536 to $804).

Dairy machinery of American manufacture is well known in Norway, and as the people generally find it very practical its introduction could easily be promoted by energetic agents, especially as there is no duty thereon.

In Stavanger County 6 creameries (of which 2 are cheese-making) have been started during the last three years.

CREAMERIES IN TRONDHJEM.

There are in all 130 creameries in the counties of Nordre and Söndre Trondhjem, and the aggregate quantity of milk annually delivered and treated is 36,000,000 kilograms (79,365,000 pounds), for which about 2,750,000 kroner ($737,000) is paid to the contractors.

GOVERNMENT AID TO SCHOOLS.

Two dairy schools have been built in this district, enjoying a Government subvention of 5,000 kroner ($1,340). No other creameries are subsidized.

CREAMERIES IN TROMSÖE.

The number of creameries in the county of Tromsöe amounts to 70, of which 32 are worked by steam power and 38 by hand. About 8,044,349 liters (8,500,365 quarts) were produced in the year 1901, and the net amount paid for same was 457,701 kroner ($122,664), or 5.69 öre per liter (1.44 cents per quart).

There are possibilities of establishing more creameries in the Tromsöe district, as dairying has been carried on only about ten years.

The creameries of the Tromsöe County are not aided by the Government in any other manner than that some of the establishments have obtained loans from the public funds against the guaranty of the communities. The interest on these loans is nominally 5 per cent (at present 4½ per cent). The time of amortization is from ten to twenty years.

Victor E. Nelson, *Consul.*

Bergen, *November 1, 1902.*

SWEDEN.

DEVELOPMENT OF THE DAIRY INDUSTRY.

By reason of the fact that a great deal of land in Sweden consists of forests or stony ground unfit for tillage, the raising of cattle and the making of butter and cheese for home consumption received early attention, although it was some time before the export developed. About 1840, improved dairy methods from Holstein were adopted, and were later on perfected or new ones discovered. The latest improvement of note took place about 1890, when the skimming machine, "separator," came in use. Two apparatus, "radiatorn" and "extractorn," which make butter direct from the milk, were also invented about the same time.

IMPORT AND EXPORT OF BUTTER.

A few figures as to the import and export of butter may be of interest. In the year 1800, Sweden imported 46,300 pounds of butter, while the export was only 15,200 pounds. Somewhat irregularly the export of butter increased up to 1868, when, for the first time, the export exceeded the import. From 1870 to 1896, the export steadily increased. Owing to increased home consumption, the export of butter has during the five years 1896–1900 showed a decreasing tendency. Thus, in 1896, the export of butter from Sweden amounted to 54,632,900 pounds, but in 1900 to only 42,246,270 pounds. During the three years, 1898–1900, the import has slighty increased; in the year last mentioned the import amounted to 1,096,680 pounds.

CREAMERIES AND OUTPUT.

During the first part of last century, there were no other creameries than "estate dairies" and "household dairies." Later on "village dairies" and "district dairies" were established, but these in the beginning labored under difficulties, partly on account of lack of interest from the farmers and partly through the difficulty of preventing the milk from getting sour. Later on, the milk was more generally kept cool by ice. About 1866, certain dairies were established which bought or received the cream only, and the farmers were paid according to the amount of butter produced from the cream delivered. The district and village creameries bought the milk from the farmers and skimmed it themselves. The same is usually the case now. The milk is occasionally tested to ascertain the amount of cream it holds. Some creameries are on large country estates; others are owned by private persons or companies who are solely engaged in the dairy business. Some farmers also own small milk separators, operated by hand, and make butter on a smaller scale. In the year 1890 cooperative dairies were started, and these have lately increased in number at the expense of the other kinds.

According to the reports of the agricultural societies in the respective counties, the creamery business showed the following figures for the year 1900: "Estate creameries," 467; cooperative creameries, 430; commercial creameries, 629; estate and commercial combined, 162; total, 1,688. Of these, 1,215 produced butter only, 287 produced only cheese, and 186 produced both butter and cheese.

The output of the creameries in 1900 was as follows:

Butter	pounds..	57, 570, 963
"Whole-fat" cheese	do....	7, 199, 637
"Half-fat" cheese	do....	3, 226, 145
"Quarter-fat" cheese	do....	403, 021
Skim-milk cheese	do....	5, 563, 401
Milk received by the creameries	long tons..	829, 016
Milk, unskimmed, sold by the creameries	do....	71, 528

GOVERNMENT ENCOURAGEMENT.

Since 1858, the Swedish Government has employed an instructor in dairying. Since 1866, an instructor in cattle raising, improvement of the breed, etc., has also been employed.

The agricultural societies—one in each county—also employ male or female instructors in the dairy business.

In the year 1887 the Swedish Government granted a yearly allowance of 8,000 kronor ($2,144) for the employment of a dairy agent in Manchester, England. His duty is to furnish information and give advice to Swedish exporters. In 1890 his salary was raised by 500 kronor ($134). It is his duty every week to telegraph to the department of agriculture and tell the state of the market in the larger English cities in regard to butter, pork, and eggs.

Besides the 433 cooperative dairy societies, there are in Sweden several other societies working for the dairy industry or the interests of the employees engaged in the same.

DAIRY SCHOOLS.

In 1858 the Government made an allowance of 6,000 kroner ($1,608) for two dairy schools. Since that year such allowances have been made from time to time. In 1899, the following allowances were made by the Government: To the dairy college at Alnarp, $2,144; to the dairy school at Bjorkfors, $804; to the dairy school at Atvidaberg, $536, and for instruction in private dairies (dairy stations), $3,752. Of these dairy stations there are 17 for the first-year course, each station having 2 female pupils, and 8 stations for the second-year course, each station turning out yearly from 2 to 7 passed pupils.

Under certain conditions, pupils may receive instruction in these schools free of charge. The rules or regulations have been prescribed by the department of agriculture.

There are also several county dairy schools working under about the same conditions as those mentioned above.

DAIRY FAIRS.

The agricultural societies, in some of the counties at least, arrange dairy fairs once a year, where the different producers of butter and cheese may compete for prizes. Sometimes several counties join in general agricultural fairs or expositions, and sometimes the department of agriculture arranges such fairs and assemblies of agriculturists and dairymen.

BUTTER TESTING.

In each of the cities of Gothenburg and Malmo, there is a board of butter samplers ("Svenska Smörprofningarne"), comprising representatives for the Government, for the agricultural societies, for the exporters, and for the dairies. These butter samplers are working under elaborate regulations approved by the department of agriculture. Their duty is to take out samples of butter intended for export and test the same as to quality, packing, the amount of brine or water contained, etc. Once a year, the experts assemble and the final tests for the year are made. The dairies having had the best butter during the year are awarded diplomas and the producers medals; sometimes also other prizes.

PROSPECTS FOR NEW ENTERPRISES.

All modern methods of dairying have evidently been tried, and I can not see any prospects for new enterprises in this line, unless it be in a better utilization of the skim milk. Dr. M. Ekenberg, of this city, has discovered a method and invented an apparatus by which skim milk can be transformed into a dry powder, completely soluble in water.

MACHINERY IN USE.

If I remember aright, the centrifugal cream separator is a Swedish invention and is still made in Sweden. There are in Sweden at least four factories or companies manufacturing cream separators; one of them claims to have sold 300,000 separators. Other kinds of dairy apparatus are also made here, and it would seem difficult to sell foreign goods of this class, unless they were considerably cheaper or superior in some way.

The De Laval Separator Company, 74 Cortlandt street, New York, N. Y., is a branch concern of Aktiebolaget Separator, Stockholm, Sweden, and Nya Aktiebolaget Radiator, Stockholm, Sweden, is represented in the United States by Mr. Fr. Franzén, 12 Broadway, New York, N. Y.

ROBERT S. S. BERGH, *Consul.*

GOTHENBURG, SWEDEN, *June 5, 1902.*

STOCKHOLM.

DAIRY FARMING.

Dairy farming is in Sweden of very ancient date, as from old chronicles we learn that from the thirteenth to the sixteenth century, dairy produce formed an article of no slight importance. During the seventeenth and eighteenth centuries the trade decreased, and only during the last three decades has it again become flourishing; and, thanks to new and improved methods and machines of home invention, has become so far developed that dairy produce has a very high rank among Swedish exports.

CREAMERIES AND OUTPUT.

The following statistics cover all Sweden:

Year.	Creameries.	Milk consumption.	
		Kilograms.	*Pounds.*
1890	1,562	506,111,800	1,115,976,519
1895	1,793	741,441,981	1,634,795,681
1900	1,688	842,280,576	1,857,228,670

GOVERNMENT ENCOURAGEMENT.

The Government supports a dairy college, chiefly intended to train teachers in the management of a dairy, this course lasting a year; it also supports two dairy schools and several stations for training dairymaids. It has also appointed an ambulant instructor of dairying, and a dairy agent at Manchester, whose duties are to work up the market for Swedish dairy products and constantly keep the dairymen informed of the demands and state of the English market.

DUTY.

The duty on dairy machines is 10 per cent ad valorem.

AXEL GEORGII,
Vice-Consul General.

STOCKHOLM, *June 11, 1902.*

SWITZERLAND.

AARAU.

CREAMERIES AND OUTPUT.

In most of the large villages of Switzerland, there exist cooperative creameries, the number in this district being over 100. The industry is conducted entirely by individual farmers independent of each other, except by an agreement between them to sell their milk at a certain fixed price, thereby forming what might be termed a trust. At Cham, in the Canton of Zug, possibly one of the largest condensed-milk factories of the world is operated. I am told that this company sends out agents among the different farmers of the country and makes a contract with them for their entire product. The consumption and output must be enormous, and the product is sent to all parts of the world, including the United States.

The editor of the "Schweizerische Milchzeitung," Mr. Pfister-Huber, is possibly the best informed person in Switzerland in regard to the milk and cheese industry of the country; and in answer to certain questions propounded by me upon the subject, he has replied in a most interesting letter, which, translated reads as follows:

I begin by referring to the statistics of Switzerland in general. As a good example of an average year, the year 1892 may serve. The amount of milk produced during that year in Switzerland was 14,521,934 hectoliters (394,830,251 gallons) of cow's milk. Of this quantity, 7,021,934 hectoliters (186,081,251 gallons) were used for the making of cheese and butter, from which the following quantities were produced:

Cheese, first quality (full cream), 815,667,600 pounds, value, $9,792,000; cheese, second quality (half cream), and third quality (no cream) 407,827,200 pounds, value, $3,556,000; butter, 191,925,808 pounds, value, $3,801,600.

The approximate number of cheese dairies in Switzerland is 5,400, half of which are situated in the mountains.

The cantonal statistics for all Cantons is not available; the following gives the figures for the most important cantons, and among others those of your consular district:

Canton.	Number of cheese dairies.	Cheese produced.	Butter produced.	Value.
		Pounds.	*Pounds.*	
Berne	650	29,920,000	4,495,920	$5,088,000
Zürich	294	7,623,000	2,623,940	1,099,200
Lucerne	307	9,068,180	1,117,600	787,968
Freiburg	229	16,297,820	(?)	1,675,392
Aargau	112	3,306,160	480,040	302,400
Vaud	175	8,593,200	1,476,000	785,707

The production of the other Cantons is not stated. The number of cheese dairies situated in the low country, in the Canton of Thurgau is 131; St. Gall, 167; Zug, 56; Schaffhausen, 10; Tessin, 28. The Canton of Tessin has 405 mountain cheese dairies, and produces 2,414 quintals (5,310,800 pounds) of first quality cheese; 1,396 quintals (3,071,300 pounds) of so-called "Ziger," a special kind of cheese for home use; and 3,285 quintals (7,227,000 pounds) of second and third quality Swiss cheese.

According to the Federal cattle census of the year 1901, there were in Switzerland 739,562 cows, which were estimated to produce 18,850,000 hectoliters (497,525,000 gallons) of milk; to this 750,000 hectoliters (19,875,000 gallons) of goat's milk has to be added.

The average consumption of milk is calculated at 225 liters (238 quarts) a year per capita of the population; this means a total consumption of 7,450,000 hectoliters (196,806,650 gallons). For feeding and fattening of cattle, about 3,000,000 hectoliters (79,251,000 gallons) are estimated to be used, 6,650,000 hectoliters (175,673,050 gallons) are turned into cheese and butter, and 2,500,000 hectoliters (66,042,500 gallons) turned into condensed milk, or in other words, 38.01 per cent is consumed as milk; 15.30 per cent is used for feeding and fattening cattle; and 46.09 per cent is used for the manufacture of cheese and butter and condensed milk.

The consumption of cream for the making of butter is proportionally small in this country, and has even diminished since 1892.

The production of "soft cheese" has considerably increased during the last ten years, and the manufacture of Swiss hard cheese (the original "Swiss cheese") has naturally also increased according to the proportions of the increase in the milk production of the country, whereas the production of so-called "half-fat cheese" (second quality Swiss cheese) has almost died out.

In regard to your questions concerning American creamery machinery, I believe that I may say that the machines and implements which we use for making cheese and butter are, with the exception of the "centrifuges" (separators), very primitive and insignificant and will always be made in Switzerland. The American implements which I have seen can not be used for our Swiss industry. However, I am very anxious to learn what machinery for the milk industry the United States could furnish us, and I would highly appreciate any information about the American milk industry.

The cheese industry is one of the most important industries of the country. The best quality of Swiss cheese is made in the mountain districts of the cantons of Lucerne and Berne, where large pastures are owned by all little townships. These townships form cooperative creamery societies. All the cattle belonging to the members of the society are driven up into the pastures during the summer, and all the profits and expenses are shared pro rata to the number of cattle owned by the members. All the stables in the mountain pastures and all the necessary implements for making the cheese are common property of the society.

PROSPECTS FOR NEW ENTERPRISES.

The possibilities for new enterprises in this line are problematical. Personally, I should say that the prospects were not encouraging, but as against my opinion there is the condensed-milk factory at Cham, and which only recently sold for $2,000,000 a branch of its concern in the United States, and is now operating exclusively in Switzerland.

MACHINERY IN USE.

The most optimistic view I can take of the subject under consideration is the possibility of the introduction of American creamery machinery into Switzerland. That used at present for the manufacture of cheese is of the most primitive nature. In answer to a letter I addressed to Messrs. T. C. Brugger & Co., of Zurich, a large firm handling creamery machinery, I have received the following:

> Replying to your favor of yesterday's date, I beg to inform you that the machinery in question (milk centrifugals) are not made in Switzerland, although they are largely used.
>
> The centrifugals are imported principally from Sweden, Germany, Belgium, England, and Denmark. America has not, as far as I know, furnished any, and the reason thereof is, in my opinion, simply because the American prices are too high. This opinion is based upon studies which I have made during and shortly after the last Paris exhibition and I have no reason to believe that matters have changed since.

OUTLOOK FOR AMERICAN MACHINERY.

It will be observed that he says that all this class of machinery is at present imported into Switzerland from Sweden, Germany, Belgium, England, and Denmark, and that he is inclined to doubt the possibility of introducing American machinery here on account of the higher prices asked therefor. In this I do not agree with him, for I am sure that if it can be demonstrated that the American machinery will give better results than the machinery now in use, a higher price will readily be obtained. The only practical way to make this demonstration would be for the manufacturers interested to send an agent among the farmers of the country who is capable of making a practical demonstration, or to consign some of their machines to dealers here who would undertake to show what they could do. The best place to establish a plant would be in Lucerne or Berne.

HENRY H. MORGAN, *Consul.*

AARAU, SWITZERLAND, *June 5, 1902.*

BERNE.

CREAMERIES AND OUTPUT.

There are 2,052 so-called creameries in Switzerland, located in the cantons as follows: Berne, 725; Lucerne, 352; Fribourg, 278; St. Gall, 152; Thurgau, 142; Aargau, 116; Zurich, 105; Zug, 61; Basle, country, 45; Niederwalden, 39, and Neuchatel, 37. Nearly all of these are cooperative societies, the farmers furnishing the milk and hiring a cheese maker who is under the supervision of a committee appointed by them. Cheese is the greater product of these creameries, butter being of secondary consideration. There are no statistics of consumption, but not enough butter is manufactured to supply the domestic market, for the import of fresh butter in 1901 amounted to 23,231 quintals (5,121,506 pounds), of which 2,204,600 pounds came from France, 1,763,680 pounds from Italy, 660,380 pounds from Austria, and the balance, 492,846 pounds, from Germany.

On the other hand, the cheese export of Switzerland to all countries in 1901 was 272,132 quintals (60,005,106 pounds), of a value in round numbers of $8,000,000, while the export of condensed milk in the same year was 307,000 quintals (67,693,500 pounds), valued at $5,000,000.

The manufacture of the Emmenthaler, or Swiss cheese, produces a by-product called here "Vorbruchbutter," a butter containing 82 per cent fat, the whey of which is not entirely washed out. It is a greasy, milky substance, unsalted, and does not keep any length of time. This is the butter in general use. Some of the dairies make a specialty of centrifugal butter, and charge as high as 36 to 40 cents a pound therefor. The "Vorbruchbutter" costs 30 cents a pound at retail. Machinery for making this butter is unnecessary.

MACHINERY IN USE.

Handpower centrifugal machines are mostly used, and these come from Sweden. The prices are high, because no other country produces machines to rival them to any extent. Hand churns are made in Switzerland.

POINT OF DISTRIBUTION.

Berne being the center of the cheese industry, would naturally be the best place in which to locate an exhibit of butter machinery. In the neighborhood of Berne is located the governmental school and experiment station for agricultural and dairy products, the indorsement of which would be of great importance to any machine in furthering the acceptance of the same by the extremely conservative element in the dairy business of Switzerland.

ADOLPH L. FRANKENTHAL,
Consul.

BERNE, *July 25, 1902.*

GENEVA.

CREAMERIES AND OUTPUT.

In nearly every village in this district is found a communal dairy conducted cooperatively. In some of the larger villages there are more than one of these establishments, each having its own set of members, where the milk is taken twice a day.

The milk is retailed by the manager of the dairy; butter is made and, in some few cases, sold to the dairy shops of the nearest large towns. A part of the cream and milk is also used by chocolate manufacturers as "cocoa cream." Cream and milk chocolate form an important product of Swiss manufacturers.

The canton of Vaud, which forms the great agricultural section of this district, has a total area of 1,244 square miles, and over 250,000 inhabitants.

Cantonal dairy associations number about 400, with over 14,000 members. For the canton of Valais, another of the three cantons comprising this district, with its very mountainous area of 2,026 square miles, with only 100,000 inhabitants, there are no statistics obtainable. It is a much less rich canton than the canton of Vaud. However, practically each village has its own dairy, besides the numerous "chalets" (Alp cottages), where milk and cream are turned into butter and cheese and sold to wholesale houses, principally in the adjoining cantons of Fribourg and Berne, for consumption in Switzerland and for exportation.

The canton of Geneva, the area of which does not exceed 223 square miles, with 120,000 inhabitants, of whom 105,000 live in towns, has about 30 dairies in the country, besides the dairy shops in the city.

The canton of Vaud alone, which as above stated forms the principal agricultural section of this district, issues detailed statistics. The latest figures obtainable for one year give the quantity of milk received by its 400 dairies as being about 1,347,000 hectoliters (35,583,600 gallons) of which 2,694,000 gallons are fed to calves, 12,974,700 gallons are consumed by the people, 12,993,700 gallons are used in cheese making, and 6,921,200 gallons are consumed by condensaries and chocolate manufacturers.

The total amount of butter made was about 2,346,300 pounds.

MACHINERY IN USE.

Nearly all the dairy machinery in use is of ancient type, and the fact that American implements are growing in appreciation throughout the country should encourage manufacturers to send good agents. Catalogues, even in the French language, are of very little practical effect.

AMERICAN MACHINERY IN SWITZERLAND.

The United States leads in the importation of agriculture and dairy machinery in Switzerland. In 1900, the total amount of imports was $504,888, of which $249,350 worth came from the United States and $181,980 from Germany.

GOVERNMENT ENCOURAGEMENT.

The Federal subsidies to the different cantons for agricultural advancement amounted in 1898 to $279,850; since then, there has been an increase. This $279,850 was apportioned as follows: For betterment of cattle, $130,661; for betterment of soil, $26,055; for betterment of horses, $20,651; for insurance of cattle, $27,020; for phylloxera, $26,055; for agriculture and horticulture, $11,773; for vine culture, $11,194; for agricultural schools, $9,264; for dairy schools, $3,860.

The cantonal government of Vaud does a great deal to develop agricultural taste among its people. Every three or four years cantonal exhibitions are held, besides the various local expositions of the products of the soil, commerce, and industry, with prizes and honorable mention granted successful and skillful laborers. Several agricultural schools are run under the control or with the help of the State. Reports are from time to time issued by the department of agriculture.

DUTY.

Dairy machinery pays at present an import duty of 4 francs per 100 kilograms (77.2 cents per 220 pounds), but, under the new tariff bill (which has not yet been accepted by the Federal Assembly, and can not be before the month of September next, when the Federal Assembly convenes) dairy as well agricultural implements will have to pay an import duty of 8 francs per 100 kilograms ($1.544 per 220 pounds). It may be stated, however, that a sentiment prevails that the nation will ask the referendum on this new tariff question.

PROSPECTS FOR NEW ENTERPRISES.

It would seem a practical move for American exporters to open agencies for their agricultural and dairy implements in this district. Lausanne, Moudon, Payerne, Nyon, and Vevey would be, besides Geneva, as centers, the most advantageous points to establish such agencies.

HORACE LEE WASHINGTON,
Consul.

GENEVA, *August 9, 1902.*

TURKEY IN EUROPE.[a]

CONSTANTINOPLE.

CREAMERIES AND OUTPUT.

There is but one properly-equipped creamery in the Constantinople district. It is situated at Ada-Bazar, a small village on the Anatolian Railway, and some twelve hours distant from this city by train. The creamery is the enterprise of an Armenian firm, and dates back some seven years, when it was started as an experiment. As such, however, it can hardly be said to have proved a success, as it barely covers its working expenses. The plans and machinery are of British manufacture.

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[a] The Turkish duty is 8 per cent.

It is impossible to get any figures giving approximate annual output. The enterprise being a private one, no statistics are published. I learn, however, that the proprietors are so disheartened that they would willingly sell out at a loss, if they could find a buyer. Their principal article is fresh butter, there being very little demand for cream, although a native-made cream called "caimak" is much appreciated.

This Ada-Bazar creamery has to compete against imported Hungarian, Swiss, Italian, Danish, and even Cork butters. Hungarian butter arrives in daily parcels by train.

It must not be forgotten that of the 800,000 or more inhabitants of Constantinople, a very small percentage of "Franks" (European non-Turks) are butter eaters in the sense known to us. In the very great majority of homes cheese takes its place, so that the consumption of butter is comparatively small. If butter is used at all for cooking purposes, it is a vile Siberian quality, which when unadulterated is strong and rank; but it is now adulterated to a great extent with oleo oil.

The natives freely use olive oil for cooking purposes, but even this is adulterated with cotton-seed and other oils.

The milk here is of the poorest possible quality, owing to lack of good pasturage for cattle. The Turks prepare a curded milk known as "yaghurt,"[a] which resembles the "junket" of Devonshire, England, and is very much relished by Turk and Christian alike. The "caimak" already mentioned, which is the nearest approach to cream, is made in this city and all over the Empire. The process is simple. A quantity of milk in large metal pans is kept simmering over a slow fire until, through evaporation, a thickish cream remains. This is made into rolls and is known as "caimak."

PROSPECTS FOR NEW ENTERPRISES.

While the prospects for new enterprises in this line are not brilliant, this consulate-general will be pleased to distribute catalogues or circulars to firms who as agents might be the means of introducing some small hand machinery.

WM. SMITH-LYTE,
Vice and Deputy Consul-General.

CONSTANTINOPLE, *July 28, 1902.*

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[a] Also spelled yogurt and yaoort.

AMERICA.

MEXICO.

CIUDAD PORFIRIO DIAZ.

BUTTER CONSUMPTION.

There are no creameries in this consular district and therefore no output, but there is a large consumption of creamery butter, which is brought from the United States, although the high rate of duty thereon places it beyond the means of the masses. It is estimated that about 1,000 pounds monthly are consumed in this town alone, although the price has ordinarily been 90 cents per pound, Mexican currency (42 cents, United States). It can be reasonably assumed that much more of the creamery product is consumed in other parts of this consular district, though I have no definite data on the subject. The general offices and shops of the Mexican International Railroad being located here, there is a large settlement of Americans, and these are mainly the consumers of creamery butter.

The fact that no Mexican butter is brought to market (in fact none produced) increases the demand for the creamery product, and this demand is a growing one.

Not only does the influx of Americans increase the demand for this product, but they stimulate the native demand.

PROSPECTS FOR NEW ENTERPRISES.

It seems to me that a rare opportunity awaits the company which will establish such an enterprise in this part of Mexico.

GOVERNMENT ENCOURAGEMENT.

The only encouragement given, so far as I know, to such industries, is the high tariff collected by the Government on the product brought into the country, it being 20 cents (10 cents, United States) per kilo (2.2046 pounds), which would have a tendency to give the market absolutely to the home product, should it be made here.

POINT FOR DISTRIBUTION.

I am of opinion that Monterey would be a proper point at which to establish an agency for distribution of machinery and also for a plant to manufacture same. Its location, some 300 miles from this port, in the adjoining State of Nuevo Leon, on the Mexican National and Mexican International railroads, and nearly the same distance from the Gulf of Mexico, and the fact that new roads are being projected, old lines extended, narrow-gauge tracks changed into standard gauge, vast acres of fertile lands opened up to settlement by ranchmen, in the cattle, sheep, and goat industry, make Monterey a commercial center.

Monterey is accessible by rail not only from the eastern section of Mexico, but directly from the City of Mexico and the southern portion of the Republic.

LEWIS A. MARTIN, *Consul.*

CIUDAD PORFIRIO DIAZ, *May 10, 1902.*

MATAMOROS.

There are no creameries situated in this consular district, and the uncertainty of rainfall and the high price of feed offer little encouragement to the establishment of such an industry in this section. Furthermore, there is little demand for butter and the other products of a creamery, among the lower classes, chiefly because they are too expensive. The butter used by the better class and the foreigners who live here comes from the United States in hermetically sealed cans, and retails at $1 (50 cents United States) a pound. Possibly, there are points in this country near the large interior cities where the establishment of an industry of this nature would be profitable, and one finding a desirable location may rest assured that, when it is applied for in the proper manner, the Mexican Government will grant as liberal concessions with regard to the exemption of duties on the importation of necessary machinery as it is accustomed to grant to the promoters of other industrial enterprises.

P. MERRILL GRIFFITH, *Consul.*

MATAMOROS, *May 26, 1902.*

MAZATLAN.

CREAMERIES.

There are no creameries for the manufacture of butter in my district.

DAIRY PRODUCTS AND CONSUMPTION.

Butter.—All butter used on the western coast of Mexico is imported. The consumption of butter is very limited on account of its very high price in the markets here, hence only the wealthy can afford to use it. All well-to-do foreigners use butter, which is mostly imported from the United States in firkins or kegs, some being packed solid and some in rolls. Butter is also imported from Denmark packed in one and two pound tin cans, and used principally in the mining camps controlled by foreigners.

Natives seldom make butter, and when they do, to an American at least, it neither tastes nor looks like butter.

The quantity of butter imported into this port annually is 1,200 pounds, valued at $1,200 ($504 United States). American table and canned butter sells for $1.25 (53 cents United States) per pound, and cooking butter 90 cents (38 cents United States) a pound.

Land is still very cheap a short distance from the city, and good lands can be bought at from $1 to $2 per hectare (2.471 acres).

Milk.—Selling milk is a very profitable business, and an unlimited amount of it can be sold, as the rich as well as the poor class use great quantities thereof in the preparation of their food. The price varies almost daily, but is never less than 60 cents Mexican (25.2 cents United States) per gallon, and often sells at $1.20 (50.4 cents United States) per gallon. On Sundays, milk always brings a higher price than on other days of the week, as more of it is used on that day. Some of the wealthiest residents of this city made all of their money in selling milk.

Cheese.—The manufacture of cheese is a paying branch of the dairy business. There is a great deal of native-made cheese used here, as all the natives like cheese and much of it is used in their cooking. Many different kinds of cheese are made, which sell from $1 to $1.25 (42 to 52.5 cents) per kilo (2.2046 pounds). Ordinary American cheese sells for $1.25 (52.5 cents United States) per kilo, but only a limited amount is used.

PROSPECTS FOR NEW ENTERPRISES.

The prospect for success in this line of business is better than any other enterprise I know of. In the first place, there is no competition whatever at the present time; secondly, the duty of 20 cents per kilo, Mexican (8.4 cents, United States), being almost prohibitory, the profit would be large, a very good business could be built up in a comparatively short time, and butter, which is now regarded a luxury, would come into general use.

Cattle.—Cattle for breeding purposes can be imported without duty and can be safely shipped by steamer, and the freight from San Francisco to Mazatlan is $20 to $40 ($8.40 to $16.80 gold) per head, and from Guaymas to Mazatlan is from $10 to $20 ($4.20 to $8.40 United States) per head. All Mexican cattle have been imported in small quantities and at different periods from the United States, and while they have proven to be a success, there were not as many imported as one might have expected. It seems that the average farmer here is satisfied with the small cattle of Mexico, inferior as milkers as well as in meat to our American cattle.

The cattle industry can be made a well-paying branch of the dairy business, as the cattle run on pasture during the entire year, and very little feeding is done. The native cattle are very poor milkers and poor butcher stock, and the milk is also of a very poor quality, but the scarcity of grass and the want of care accounts to a great extent for this state of affairs.

LABOR.

Labor is very cheap; cheap in the amount of money paid for its performance but dear in the result obtained by it, as a good American laborer will do as much work and to a better purpose than three Mexicans.

A farm laborer is paid 37 to 40 cents (15.5 to 16.8 cents United States) per day, and in addition to this he receives rations of tortillas (a kind of thin corn cake) and beans (which are cooked like our Boston baked beans), upon which mainly he exists during the entire year.

GOVERNMENT ENCOURAGEMENT.

I do not think the Federal Government would do anything toward giving financial aid to any enterprise of this kind, but I feel sure a suspension of taxes, both state and municipal, could be secured for a period of five to ten years, upon the recommendation of the governor of the state.

MACHINERY.

Mazatlan has one of the largest and best-equipped foundry and machine shops in Mexico, and all kinds of machinery can be made here, providing drawings and specifications can be furnished; and the price, the managers informed me, would be in Mexican money what it would cost in the United States in gold.

POINT FOR DISTRIBUTION.

I know of no better point than Mazatlan in which to establish a creamery plant, and one establishment in successful operation would soon create a demand for machinery for that purpose and a very handsome profit could be realized. I would therefore strongly urge anyone interested in such an enterprise to come and look over the field in person.

Mazatlan is one of the largest and most important commercial ports on the western coast of Mexico, has 20,000 inhabitants, is healthy and prosperous, has a lovely climate, is very rapidly improving, and is a point that all Americans desiring to branch out to foreign countries should keep under observation.

LOUIS KAISER, *Consul.*

MAZATLAN, *May 5, 1902.*

MONTEREY.

CREAMERIES AND OUTPUT.

There is only one creamery in this district that I can learn of, that of Cupp & Whitfield, in Monterey, who conduct quite a large establishment and do a splendid business. They use American machinery of the latest type. I understand their business per annum amounts to $40,000 Mexican.

This is not at present a dairy district, as the working classes do not not use butter.

PHILIP C. HANNA,
Consul General.

MONTEREY, *May 3, 1902.*

TAMPICO.

There are no creameries is this district, and none is contemplated.

TARIFF ON MACHINERY.

The duty on creamery machinery is: For hand machines, 5 centavos per kilo (about 2 cents per 2.2 pounds), and for other power, 1 centavo (0.04 cent) per kilo.

CONSUMPTION.

There is an increasing demand for butter here, which is largely supplied by Monterey, retailing for 70 centavos (about 30 cents United States currency) per pound.

Cheese forms an important part of a Mexican meal, the native article selling in pound cakes for 30 centavos (13 cents United States), and the imported Swiss and American for from .80 to 1.50 per pound (33 to 63 cents United States).

There would be no inducement at present to establish a creamery here, as milk brings a large price, 20 centavos (8.4 cents United States) per quart; but this coast country being especially adapted for the raising of cattle, the dairy and creamery business will sometime flourish.

SAMUEL E. MAGILL, *Consul.*

TAMPICO, *June 26, 1902.*

TUXPAN.

The creamery industry does not exist here, and no serious attempt has yet been made to develop such an undertaking, although there seems to be a good opportunity for an enterprising person with capital to engage in the business. There appear to be no special inducements held out by the Mexican Government in regard to this industry.

A. J. LESPINASSE, *Consul.*

TUXPAN, *May 23, 1902.*

VERA CRUZ.

BUTTER CONSUMPTION.

Creameries are in general unknown to the native population of this consular district, and butter is used but very little and only by the wealthier class of people. Those and the foreign element, which is not very largely represented, use such as they can procure, mostly imported from Spain, Denmark, Germany, France, and the United States. As a rule, shipments from the former countries prove to be a fairly good article, from the fact that they are put up in one-half and 1 pound tin cans, a good size for use in the Tropics. That received from the United States, being put up in larger packages and therefore not finding so ready sale, is apt to be found, on opening, unfit for use in many instances. It can also be procured from American creameries located in the interior of the Republic. Prices of imported butter vary from 90 cents to $1.25 Mexican currency (37.8 cents to 50.5 cents United States) per 1-pound tin can; prices of butter produced in the interior, from 45 to 55 cents (18.9 cents to 23.10 cents United States) per pound at the point of production, to which transportation has to be added, so that it will cost at the point of consumption from 75 cents to $1 (31.5 cents to 42 cents United States) per pound. It is wrapped in paper and packed in wooden boxes and can not stand the heat of the Tropics.

PROSPECTS FOR NEW ENTERPRISES.

To establish plants for the manufacture of creamery machinery in this consular district would be next to a total loss. The only plan would be, in my opinion, to establish agencies for the distribution of such machinery, and it would be advisable to have one of the hardware merchants in this city to act as such, inasmuch as they have their own traveling salesmen and other connections with the interior, and are well acquainted with the situation and circumstances. The following firms are reliable and have English-speaking clerks: R. Varela e hijo, Calle Principal and Salinas; M. During & Co., Sucess., Portales de Diligencias; Sommer, Hermann & Co., Calle Principal, No. 27.

WILLIAM W. CANADA, *Consul.*

VERA CRUZ, MEXICO, *May 31, 1902.*

ARGENTINE REPUBLIC.

ROSARIO.

There are probably more than a score of creameries of different grades in my consular district, but I have been able to secure but meager details. I give below a synopsis of such information as I have gathered.

CREAMERIES AND OUTPUT.

1. The Carcarañá Cremeria, located at Carcarañá, owned by Thomas & James (Americans), turns all its products into cheese, of which they now have an annual output of about 225,000 kilos (495,135 pounds), all of which is sold in this country.

2. The Cremeria Harmonia, located at San Geronimo, Robert Hope, proprietor, makes an annual average of 56,250 kilos of cheese, the receipts from which amount to $32,912.45 national money (equivalent to a little less than $14,000 United States gold).

3. The Cremeria la Rio Paraná, Messrs. Canepa & Quarantelli, proprietors, having its principal office and laboratory here in Rosario, at No. 980 San Martin, and with branches at Roldan and Villa Casilda (suburban villages), makes the following statement:

In Rosario there are manufactured annually 125,480 kilos (276,675 pounds) of butter, of which 42,800 kilos (94,324 pounds) are shipped to England.

In Roldan there are produced annually 2,920,000 liters (3,095,200 quarts) of milk, of which 1,200,000 (1,272,000 quarts) are converted into cheese and the remainder into butter.

In Villa Casilda there are produced annually 1,460,000 liters (1,547,600 quarts) of milk, all of which is made into butter.

4. The Cremeria of Tapper & Co., at Marcos Juarez, F. C. C. A., has been but recently equipped, and the proprietors report that in the six months ended June 30 last they produced 23,000 kilos (50,715 pounds) of "Cheddar" cheese as a principal product.

5. The Lecheria Rosario, Mr. Ferdinand N. Jacobsen, proprietor, with six points for distribution of its products in this city, reports that all his products are consumed in the city, as follows: Of the 1,080,000 liters (1,144,800 quarts) of milk annually produced there are sold 324,000 liters (343,440 quarts) of pasteurized milk for family use, and 756,000 liters (801,360 quarts) are consumed in the production of butter.

OUTLOOK FOR NEW ENTERPRISES.

As to prospects for new enterprises in this line, I can only say that this being an almost perfect pastoral country, its soil yielding luxuriantly the most succulent of foods for milk-producing animals, and the climate being mild the year round, it should be an ideal site.

The Government gives no special encouragement to this industry, but the encouragement to all industries for the development of the magnificent resources of this land is becoming year by year more marked.

I do not think it advisable to contemplate the establishment here of plants for the manufacture of dairy machinery, or for any other manufacture requiring power, because of the paucity of the fuel supply.

DUTY AND MACHINERY IN USE.

Our improved machinery should find a ready sale if intelligently represented.

As to the duty on dairy machinery the customs department professes itself unable to state, as different articles or parts are subject to different gradings for taxation.

The machinery already in use, much of which is antiquated and should be replaced, is from England, Germany, France, and the United States, in the order named as to quantity.

JAMES M. AYERS, *Consul.*

ROSARIO, *August 7, 1902.*

BRAZIL.

RIO DE JANEIRO.

DAIRY PRODUCTS.

The dairy industry of Brazil is yet in its embryonic State, but is susceptible of development through the introduction of modern methods, modern machinery, and chiefly foreign cows.

There is a decided lack of milch cows even in those states where nature has placed no impediments on dairy farming—Minas Geraes, Sao Paulo, and the three southern States, Parana, Santa Catharina, and Rio Grande do Sul.

Two years ago, I made a trip through the interior of the State of Parana, in whose plateaus there is an abundance of fine grazing lands. I frequently noticed large herds of cattle which, at a distance, made quite a favorable impression. A closer inspection, however, revealed the fact that those animals consisted mainly of skin, bones, and horns. The cows were milkless, and the bulls lacked that characteristic air of equipoise and force which is the result of high breeding and good living. They were the degenerate descendants of very fine ancestors, brought into Brazil in former centuries by the Spanish Jesuits. There were cows all around, but not a drop of milk. Nobody found it worth while to milk a cow.

During the two weeks I traveled in the interior of that State, I never succeeded once in obtaining milk or fresh butter, and the canned butter which adorned the breakfast table here and there was simply uneatable.

That it is possible to make excellent butter and cheese in Brazil is proven by the comparatively small product of Minas Geraes which reaches the Rio market, and by the savory article served in the German colonies of the South.

PROSPECTS FOR NEW ENTERPRISES.

Those interested in the introduction of American dairy machinery in Brazil will have to take into consideration the present impecuniousness of the masses, the want of transportation facilities, so calamitous to the producers of perishable goods, the conservatism of the rural population, and the lack of ice and refrigerators.

All these obstacles may be overcome by a patient and systematic agitation, through skillful agents who speak Portuguese and know the country.

GOVERNMENT ENCOURAGEMENT AND DUTIES.

The dairy industry here is in no manner aided by the local, State, or National Government. There is some machinery imported into Brazil. It is not especially enumerated in the Brazilian tariff, but would be classified as "Machinas" (classe 34 A), and pay a duty of 15 per cent ad valorem.

DEALERS.

I would advise those interested to enter into correspondence with Messrs. Walter Bros. & Co., Caixa 7, and with Messrs. James Mitchell & Co., 55–57 Ruo de Ouvidor, Rio de Janeiro.

EUGENE SEEGER,
Consul-General.

RIO DE JANEIRO, *June 3, 1892.*

BAHIA.

DAIRY PRODUCTS.

There are no creameries or dairies, as we know them in the United States, in this district.

Milk.—The sweet milk trade is in the hands of numerous private parties, who keep a few cows in the suburbs of the city and either send the milk in tin cans to their regular customers or lead the cows around the street and milk them before their customers' houses. There is no place in Bahia city where fresh sweet milk can be obtained at all hours during the day, and buttermilk and cream are unknown commodities. In general, the cows are only milked in the morning, and a sufficient supply of milk for the day is then bought by such persons as use the article. The use of milk is vastly disproportionate to the number of inhabitants.

I have found that where cows were not milked to supply customers, either the calves were allowed to take all of the milk, or in a few places where there was an abundance of laborers, the milk was taken and allowed to curd, the curd being subsequently boiled and pressed to form a tasteless variety of cheese called "requeijao," which is much in demand both in the city as well as the country.

Butter.—There is no place in or near Bahia city where fresh butter can be obtained, nor is there a cheese factory in this section. Even during a recent extensive trip through the interior of this consular district, including a section which produces large quantities of cattle, I could not find a place where butter is being made for sale; yet it could be made, as was demonstrated on a farm managed by an American, where daily he had made sufficient for his own family's consumption.

All of the butter used here is either imported from the south of Brazil or from Europe and the United States. By far the greater part of it comes from abroad, national butter having been introduced only within the past few years.

MACHINERY IN USE.

There have been a few American churns imported, but the sale has not been great, for the reasons stated. In some cases where churns have been purchased, their use has been abandoned for a gourd or bottle, into which the milk is put and agitated by hand until the butter separates.

GOVERNMENT ENCOURAGED.

I can not find that the state government has given any encouragement to creameries or dairies, and for the reasons already given, I do not think that this would be a desirable place in which to seek business along those lines.

H. W. Furniss, *Consul.*

Bahia, *June 9, 1902.*

PERNAMBUCO.

CREAMERIES.

There are no creameries in this district, although there are a few farms where cows are kept for the sale of milk.

The consumption of butter and cheese here is considerable, but statistics can not be obtained as to quantity.

PROSPECTS FOR NEW ENTERPRISES.

The prospects here for the establishment of creameries are not good, because of the tropical climate. European cattle soon degenerate here, and their milk is not rich enough to make butter in sufficient quantity to pay.

The interior highlands of this district are more favorable to the creamery industry, and some poor cheese is made there.

IMPORTS OF BUTTER AND CHEESE.

The butter consumed here comes from France, the United States, Denmark, and South Brazil, the bulk from France, although the other countries are increasing their importation, especially the United States.

The cheese comes from Holland, the United States, and England in the order named, as well as from the interior of this State and southern Brazil.

W. L. SEWELL, *Consul.*

PERNAMBUCO, *June 4, 1902.*

SANTOS.

CREAMERIES AND OUTPUT.

I find it very difficult to obtain particulars as to output and consumption, for nearly all the plants here are run on a very small scale. My consular district is very large, comprising the four States of Sao Paulo, Parana, Santa Catharina, and Rio Grande do Sul. In the States of Santa Catharina and. Parana the dairy industry has been very much neglected and but little dairy machinery has been sold there. In the State of Rio Grande do Sul there are a great many cattle, but the people make but little butter and cheese, except for home consumption. Some of their plants have the capacity, and if properly managed could be made to produce nearly double the quantity of cheese and butter now being made. They milk from 25 to 100 cows, but the grasses grown there are not nutritious and the cows do not get the proper kind of feed for rich milk. There are but few American separators in that State. The climate is good.

MACHINERY.

The state of Sao Paulo has more dairy machinery, perhaps, than the other three States mentioned, but I have never heard of any butter and cheese being exported, as the people find ready sale for all they produce at home. In the vicinity of Santa Barbara there are a few separators. One is owned by Mr. Alonzo Keys, with a capacity of 250 quarts per hour. It was imported from Holland. In the vicinity of Villa Americana there are several separators, with capacities ranging from 100 to 200 quarts per hour. Three are of American make. Mr. Will Cullins, of Boacatas, has one of 250 quarts capacity. The Brazilian dairy, the experimental dairy farm, and Mr. Ben. Terrill, all of Piracicaba, have separators ranging in capacity from 100 to 300 quarts per hour. They milk from 25 to 100 cows each, and while they get a quantity of milk, it is not rich. The Swiss dairy in the city of Sao Paulo has a separator of 250 quarts capacity. The product is sold to the people of that city. From what I have heard, the State of Minas produces perhaps more butter and cheese than any other State in Brazil.

There are three hardware merchants of Sao Paulo who keep separators for sale. They import them from Holland, England, Germany, France, and the United States, and sell them at from 500 to 700 milreis ($100 to $150) each. I know of no one in Santos who keeps them for sale. This is not regarded as a good cattle country, the insects being the greatest drawback to the industry.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for new enterprises in this line, in my opinion, are good in any of the four States of this district for selling the separators or for establishing new plants. The best butter is imported from Denmark. The butter made here sells for 6 milreis per kilo, or about 75 cents per pound, and milk and cheese in proportion. If a practical and energetic dairyman from the United States were in the business here, and would give it as much attention and energy as he does at home, he ought to do well. In my opinion the people of the United States are neglecting this country, for Brazil is an excellent field for nearly all branches of business, and it is practically undeveloped. The natural advantages of this country are all that could be desired. One finds the best soil, plenty of water, timber, and minerals of nearly every kind, lowlands, table-lands, and mountains. A man can work every day in the year, and nearly all kinds of fruit and vegetables mature here every month.

Of course, it will require money to make a start. Common labor is cheap. The high rate of taxes is a serious drawback. Everything, from the products of the farm to a flag pole, is taxed.

TARIFF.

The duties are much higher on nearly everything than in the United States. The duty on machinery, however, is light. On milk separators the duty is 15 per cent on the value of the machine.

J. H. JOHNSON, *Consul.*

SANTOS, *July 25, 1902.*

CHILE.

CREAMERIES AND MACHINERY.

There are no available statistics concerning creameries in Chile, not even as to the number of industries of this class, and all information obtained on the subject must be secured through private sources, and is more or less unreliable. There are no creameries in the principal cities of Chile—Valparaiso, Santiago, and Concepcion. To the north of Valparaiso there are five, one at each of the following places: Limache, La Pana, Llaillai, Ocoa, and Coquimbo. Some, possibly all, of these creameries use centrifugal-force machinery for extracting butter from the milk. To the south of Santiago, a distance of 17 miles, is a large dairy and creamery where milk is brought to turn into butter, where the cream is also extracted by centrifugal machinery. Farther south, 40 miles from Santiago, is the estate of Señor Nathan Miers Cox, on which is established one of the largest creameries in Chile, where the Burmeister centrifugal is used to extract the cream from the milk. At this creamery, milk is purchased and collected from considerable territory in the surrounding country. At Rancagua, farther south, there are two creameries, where centrifugals are used in the extraction of cream for butter. To one of those dairies, milk is also brought to extract cream for butter. Farther south there are no creameries where cream is extracted by machinery.

Any attempt at data as to the output of the creameries in Chile would be misleading, as the information would be based upon hearsay. An estimate would be guesswork. There are no statistics in the customshouse showing the value of machinery imported for creamery purposes, or the number of cream separators (maquinas centrifugas separadoras de crema).

One of the best-informed men in Chile on the creamery business tells me that the use of centrifugal separators is increasing.

GOVERNMENT ENCOURAGEMENT.

No direct encouragement is given by the Government to the creamery business in Chile. There is a national society of agriculture, sustained by subscriptions from its members, and also by a Government subsidy paid annually. This society occasionally holds an exhibit of the agricultural products of the country.

DUTIES.

There is no customs duty on machinery used for creamery purposes in Chile.

OUTLOOK FOR AMERICAN MACHINERY.

The majority of the machinery of this class imported into Chile is of American manufacture. As above stated, the demand seems to be increasing and the prospect for future trade better than it has been in the past. I am unable to quote prices prevailing here, as there is no regular trade in this line of machinery.

R. E. Mansfield, *Consul.*

Valparaiso, Chile, *July 22, 1902.*

ANTOFAGASTA.

There are no creameries or dairies of any kind in this consular district, and all dairy products consumed therein, among which is some butter come chiefly from other parts of Chile.

Prevailing price: Chilean butter, 56 cents per Spanish pound; foreign, 37 cents.

No foreign butter was directly imported during the past year. Moderate quantities of Danish butter were to be had, but it came coastwise and was counted with the Chilean product.

The quantity imported coastwise, nearly all Chilean product, was 85,000 kilos (187,391 pounds).

Duty on foreign butter, 10½ cents gross weight per kilo (2.2046 pounds).

GENERAL OBSERVATIONS.

This consular district is a desert west of the Andean foothills. Except in the larger oases, water holes and springs and distilled salt water constitute its chief water supply. Antofagasta has a pipe line from a point in the Cordillera 200 miles distant and 12,000 feet above tide water. This water is sold for 50 cents per ton, which is not dear under the circumstances. The quality is excellent, both for domestic and industrial uses. Ships prefer to take supplies here rather than at any other port on the coast.

There is no agriculture. The residents in the oases and valleys of the foothills get small crops, hardly equal to their own needs, while the alfalfa produced is needed for the animals driven over the Cordilleras from the Argentine Republic, with supplies for coast towns and mining camps. In truth, everything needed for man, beast, and industry is brought from the outside. There are no oxen employed in haulage, and the considerable number of cows do not produce milk enough for domestic wants, which are supplied by imported condensed milk. Cured alfalfa, chopped and in bales, costs $1.05, barley $1.83, and bran $1.02 per Spanish quintal (102 pounds), and water in coast towns from 50 cents to $2.50 per ton. These prices make it impossible to keep stalled cows for dairy purposes. In the south of Chile, the industry might be established. Pasturage is cheap, there are great numbers of cattle, and much attention is given to dairy work; but to safely determine the possibility of such an enterprise an expert should be sent to the coast.

CHARLES C. GREENE, *Consul.*

ANTOFAGASTA, *June 18, 1902.*

URUGUAY.

MONTEVIDEO.

CREAMERIES AND OUTPUT.

The creamery system, in its relation to butter making, is hardly known in the Republic of Uruguay, notwithstanding the fact that this is one of the finest pastoral countries found anywhere on earth, where grasses of some kind grow all the year, and where snow and ice are not known, the few frosts in June and July being hardly sufficient to arrest semitropical vegetation. It would, therefore, be supposed that the dairy industry would naturally develop from the great herds of cattle found all over the Republic; but such is not the case, and butter making for market is a small affair, of no export value, and barely sufficient to meet the local demand at the steady average retail price of 40 cents per pound the year round. But few modern appliances are found in use, and these only in the Swiss colony, where hand separators (Swedish) are used for cream gathering, the milk afterwards being converted to cheese. The consumption of butter is light, comparatively, and is confined almost exclusively to the cities. It is an unfortunate fact that many estancia tables are free from the presence of butter, and yet thousands of cattle graze near by. Of course the lack of cold preservatives is an element to be considered, for ice is only to be had in the cities, of the manufactured sort, and is worth never less than $30 per ton.

In the Swiss colony, in the department of Colonoa, are operated two creameries, each having a capacity of 200 kilos (441 pounds) a day. These take the milk from neighboring farmers, and are thus enabled to produce the small output named. The separators and auxiliary machinery are all Swedish, and the butter is of a very excellent quality. Montevidean families who use butter are generally supplied daily, in the morning, when the butter, unsettled, is left by the milkmen, in such quantities as may be wanted, wrapped in oiled paper. It is good, rather colorless and greasy than otherwise, and will keep about two days, unless the heat is unusual.

GOVERNMENT ENCOURAGEMENT.

The agricultural department of Uruguay, with a view to creating an exportable product for European markets, is giving much attention to the development of dairy products, but the handicap of the lack of cheap and sure refrigeration, with the high cost of fuel ($9 gold per ton for coal), is freely recognized as a serious factor. The Government makes liberal provision for all machinery going directly into factories, in the way of abatement of duties in part, if not altogether.

BUTTER VERSUS OLIVE AND COTTON-SEED OIL.

Olive oil and marrow fat take the place of butter in domestic use here. In reference to the olive, it should be here stated that most of the so-called olive oil is refined cotton-seed oil from the United States.

ALBERT W. SWALM, *Consul.*

MONTEVIDEO, *June 5, 1902.*

AUSTRALASIA.

NEW SOUTH WALES.

CREAMERIES AND OUTPUT.

The number of dairy cows in this State was, in 1900, 420,148, yielding 149,153,000 gallons of milk annually; of this, 114,069,000 gallons were used for butter, which yielded 41,479,794 pounds. There was used for cheese 3,559,000 gallons, producing 3,559,000 pounds.

The average yield of milk per cow is about 355 gallons per annum.

The introduction of the factory system in convenient centers, the great improvements effected in dairy appliances, and the establishment of direct railway communication with Sydney have done much toward developing the industry. Dairy farming is not now, as formerly, wholly confined to farmers, as many graziers, in a large way of business, especially in the coast districts, have lately turned their attention to the industry, and are likely to find it profitable. When the factory system was first introduced the factories were mostly cooperative, and the processes of cream separation and butter making were carried on together. This arrangement is gradually dying out, and central butter factories, fed by numerous separating places called "creameries," are taking the place of the others. The advantages to be gained from the change are considerable; a butter of more uniform quality is made in each center, and there is a reduction in the cost of manufacture, owing to the greater quantity made and the improved appliances, such as refrigerators, which the larger establishments can provide.

The quantity of milk required to make a given weight of butter varies considerably, according to whether the milk is treated by a separator or in the old fashion. For butter which is termed factory or separator made, the average quantity of milk used per pound of butter produced is 2.75 gallons, or 26 pounds 2 ounces. For ordinary hand-made butter, the quantity required is about 3 gallons, so that there is a saving of about 13 per cent by the former method, in addition to the extra value of the butter produced; the price in Sydney markets during 1900 being from 1 cent to 2 cents per pound higher for the factory-made butter.

The number of hands employed at dairy farming in 1900 was 27,171; of these, 15,015 were males and 12,156 females. Included in the total are 284 persons employed in certain farm factories and omitted from the returns of manufactories and works. The number employed in factories proper and not included in the foregoing total, was 1,070.

Prior to 1890, the state was under the necessity of importing a considerable quantity of butter to meet local requirements; but from that year an export trade was commenced, the surplus increasing from

281,241 pounds in 1890 and 838,296 pounds in the following year to over 1,000,000 pounds in 1892, nearly 3,000,000 pounds in 1893, and over 4,000,000 pounds in 1894; but the unusual severity of the season brought down the production in 1895 to slightly below local requirements. The following year, also, was not favorable to the dairying industry, but an improvement in production took place, resulting in a surplus of 592,962 pounds, while the net exports for the year 1897 reached over 3,250,000 pounds. The net exportation during 1898 was over 7,750,000 pounds, more than double the quantity exported the year before, and it will be noticed that the larger quantity shipped affected the local consumption considerably. In 1899, the exportation was considerably lower, but rose again during 1900 to nearly 8,500,000 pounds.

The greater quantity exported goes to England. Nearly one-third of the total amount imported into London was from Australia, bringing the highest ruling prices.

It is probable that other milk products will shortly receive more attention at the hands of farmers. Already some attention has been given to the manufacture of condensed milk, while a similar product, known as "concentrated milk," is made. This article will keep for months in cool chambers, and is largely used on the Peninsular and Oriental Company's steamers. Being without sugar, it has all the richness and flavor of fresh milk, and in this respect is more useful than condensed milk, which is not palatable to many people. Since the commencement of the industry, the export of concentrated milk has advanced from 2,848 pounds in 1895 to 13,494 pounds in 1898, and 86,897 pounds in 1900. Of the total exports in 1900, 39,775 pounds were forwarded to South Africa and 35,788 pounds to the Philippine Islands. Up to the present time, no great strides have been made in the manufacture of condensed milk.

The value of the produce of the dairy industry is estimated at £2,878,000 ($13,756,187) for the year 1900. The value of milk not made into butter, but used for human consumption, was £1,242,000 ($6,044,193); of butter, £1,555,000 ($7,562,407), and of cheese, £67,000 ($326,065), while the balance of the milk, used mostly in feeding pigs, was worth, approximately, £14,000 ($68,131). The dairy cattle of the state were valued at £3,046,000 ($14,823,359).

ORLANDO H. BAKER, *Consul.*

SYDNEY, *June 30, 1902.*

NEWCASTLE.

CREAMERIES AND OUTPUT.

Recent years have shown a decided increase in the number of creameries. Where formerly a large acreage was planted in corn there are now pastures for milch cows, especially in the northern portion of this district. The number of creameries in the northern half of this State is 84, which treated during the past year 10,778,497 gallons of milk, obtaining 10,397,137 pounds of cream. There are both cooperative and proprietary creameries, the former gradually superseding the latter. The continued development of this industry is now assured, each year showing a larger number of farmers who turn their attention to it.

GOVERNMENT ENCOURAGEMENT.

The Government encourages the industry by admitting, duty free, the materials for the manufacture of butter, excepting salt; establishing colleges replete with the latest information on dairying, and arranging for instructors to visit and give information to managers of creameries, and as a result the butter standard has been very much improved. A conference of creamery managers was recently held, under the auspices of the department of agriculture, to arrange for a standard grading of butter, especially for the English markets. No definite decision was reached at the time, but all are convinced that such a standard will be adopted in the near future.

TARIFF.

Milking machines, cream separators, testers, pasteurizers, automatic can making and closing machines, white pine for the manufacture of butter boxes, and firkins and parchment paper are admitted free of duty, while on butter and cheese there is a duty of 3 cents per pound, and on preserved milk 2 cents per pound.

PRICES OF MACHINERY, ETC.

The lumber is brought from New Zealand, value $25 per thousand. Paper from Europe, value 8½ to 9 cents per pound. Other apparatus costs:

Churns, 20 pounds, $18.75; 60 pounds, $33.75; 500 pounds, $125; 1,000 pounds, $210; made locally.

Hand butter workers, 24 inches by 4 feet, $32.50; 30 inches by 6 feet, $52.50.

Machine butter workers, 3 feet 9 inches roller, $80; 8 feet, $325; all locally made.

These prices include all necessary gear. Other utensils cost about the same as in the United States. Pasteurizers are of Danish, American, and Swedish manufacture. Separators are of Danish, Swedish, American, and English make. Prices of these are: One hundred gallons per hour, $200; 65 gallons, $150; 45 gallons, $100; 10 gallons, $37.50.

The American steel can, capacity 10 gallons, gives very satisfactory results. It has been but recently introduced, and sells for $4.50. It is extremely difficult to give prices of all items on account of the great variety used here.

Most of the engines are manufactured here, as well as the commoner utensils, but there is a great field for American capital and industry if representatives were on the spot.

F. W. GODING, *Consul.*

NEWCASTLE, *August 23, 1902.*

VICTORIA.

CREAMERIES AND OUTPUT.

In the state of Victoria, Australia, there are 238 butter and cheese factories with 372 creameries attached, and the approximate output and consumption of butter, according to a return furnished by the secretary of agriculture for Victoria, are:

Description.	1899.	1900.	1901.
	Pounds.	*Pounds.*	*Pounds.*
Output	69,144,187	72,180,959	65,154,075
Consumption	32,906,718	34,387,798	36,007.682
Export	36,237,469	37,793,161	29,146,393

The decrease in the output of last year is due solely to an exceptionally dry season, and as there is a great deal of land eminently adapted for dairying in the state and not yet devoted to that purpose, there is every prospect of the industry being further developed.

GOVERNMENT ENCOURAGEMENT.

In order to encourage the industry, the Victorian department of agriculture provides a number of instructors to travel around the country teaching dairymen. Facilities are also provided by the department to have the butter for export properly handled and frozen prior to shipment. Prizes are also offered for the best butter in each district, while exhibitions of the most up-to-date appliances take place at agricultural shows throughout the state.

PRICES OF DAIRY MACHINERY.

As an indication of the prices prevailing for dairy machinery and appliances, I append below a reliable list of articles required in connection with both steam-turbine and belt-driven creameries, and also for butter factory plant.

Steam-turbine creamery plant.

One 6-horsepower horizontal boiler	$413.65
One 440-gallon "Alfa-Laval" steam-turbine separator	510.98
One "Primus" milk heater	121.66
One 200-gallon milk-receiving tank, with tap	24.33
One 200-gallon skim-milk tank	19.46
One 400-gallon iron water tank	17.02
One pump for skim milk and water	109.49
One wooden wash-up sink	13.98
One 10-gallon measuring vat	4.25
All necessary piping and fittings for a complete system of reticulation inside of building	36.49
Total	1,271.31

Belt-driven creamery plant.

One 6-horsepower horizontal boiler	$413.65
One 4-horsepower horizontal engine	231.15
One 400-gallon "Alfa-Laval" cream separator	462.31
One 200-gallon tinned steel milk-receiving vat, with tap	24.33
One 200-gallon galvinized-iron skim-milk receiving vat, with tap	19.46
One "Primus" milk heater	121.66
One skim-milk rotary pump	41.36
One water pump	36.49
One 400-gallon iron water storage tank	17.02
One wooden wash-up sink	13.98
Necessary piping and fittings to complete a system of steam, water, and milk reticulation inside of building; also requisite pulleys, shafting, bracket bearings, and belting	121.66
Total	1,503.07

Butter factory plant.

One 8-horsepower horizontal boiler	$510.98
One 6-horsepower horizontal engine	16.32
Two 400-gallon "Alfa-Laval" cream separators, each	462.31
One 600-pound trunk lid concussion churn	155.72
One 112-pound double roller butter worker	133.82
One 600-pound "Avery" platform scales	46.22
One rotary milk pump	51.09
One water pump	36.49
One 200-gallon milk receiving vat, of tinned steel	24.33
Two 300-gallon maturing vats, each	48.66
One cream pump	85.16
One "Primus" pasteurizer	121.66
One "Primus" cooler	121.66
One 200-gallon skim-milk receiving vat, of tinned steel	19.46
One 400-gallon water storage tank	17.02
One 24-bottle milk tester	60.82
One wash-up sink	13.98
Two wooden butter barrows, each	21.89
Necessary pulleys, shafting, bracket bearings, belting, piping, and fittings	291.99
Total	2,239.58

MACHINERY IN USE.

In addition to the cream separator, which, of course, is the principal item in connection with the skimming station, the pasteurizer is the only other article imported, all other appliances and machinery being manufactured locally. The "Alfa-Laval" separator, which is of Swedish manufacture, is the one which has been adopted almost entirely by the factories and creameries throughout the State, it being estimated that 97½ per cent of the companies use it to the exclusion of all other makes. These latter comprise: "The Alexander," "Melotte," "Victoria," "Empress," "Princess," "Sharples," "Crown," "Perfect," "Burmeister," "Main," and "Victory," all of which have been placed on the market at various periods.

DUTIES.

Dairy appliances, cream separators, testers, pasteurizers, etc., are admitted free of duty in the Commonwealth of Australia. Engines are taxed 15 per cent.

JOHN P. BRAY,
Consul-General.

MELBOURNE, *June 21, 1902.*

ASIA.

COCHIN CHINA.

In reply to circular, dated the 11th April last, referring to "creameries in foreign countries," I have to inform you that there is no creamery whatever in Cochin China.

E. SCHNÉEGANS, *Commercial Agent.*

SAIGON, *June 10, 1902.*

JAPAN.

Creameries are almost unknown in Japan. Aside from condensed milk and fresh milk, in limited quantities, the Japanese people are prejudiced against dairy products.

E. C. BELLOWS,
Consul-General.

YOKOHAMA, *June 6, 1902.*

SIBERIA.

CREAMERIES AND OUTPUT.

There are no creameries on a large scale in this region. There are several large dairy farms where butter is made for local consumption and a quantity of milk sold. One establishment is run by a Swiss, another by a German.

No systematic attempt has been made so far to introduce modern methods and machinery. There is nothing between Vladivostok and Irkutsk approaching the phenomenal business in butter lately begun in western Siberia.

Three years ago Siberian butter was not considered worth classifying on the London market. Now it has nearly reached in quantity that of Denmark, but ranks second in quality. The business done by the British firm which runs the special refrigerating cars from Omsk Kourgan, and Riga, by means of the Wilson line of steamers, to London is rapidly augmenting, and amounted to 72,000,000 pounds in 1901, needing 4 special trains of 25 cars each. There are not cars enough to supply the demand. From Cheliabinsk to Omsk there are 2 daily trains, averaging 6 cars each. The time occupied is about 3 days, at a speed of 23 miles an hour. All these cars are marked "London—Omsk."

The beginning of this industry was due to Danish initiative, but British capital and enterprise now have charge of the business.

An order for 108,336,000 pounds of this western Siberian butter has been given within the month. The refrigerating cars are kept at an average temperature of 12° R.; never higher.

There is said to be a promising market for this butter in Manchuria. The Chinese cattle are not bred for milk production so much as for beef. It has been suggested to run the refrigerating cars over the Chinese Eastern Railroad into Manchuria. This would have been done but for the spread of the cholera at Harbin in July. Arrangements havė been made by the local branches of the Government bank to advance loans on duplicate invoices for this western Siberian butter trade.

PROSPECTS FOR NEW ENTERPRISES.

There are no statistics available as to the output and consumption of milk and butter in eastern Siberia. Milk is not a general drink, even in tea. Peasants are glad to get black bread without butter, and tea in which a lump of sugar is occasionally dipped; therefore it is difficult to estimate the prospects for foreign enterprise in this direction.

It might as well be understood, for this particular industry as well as for all others, that the policy of the Government is to foster all home enterprises.

TARIFF.

The European and the retaliatory tariff would seem to act as a prohibition to the import of American dairy machinery. The present is no time for experiment here.

R. T. Greene, *Commercial Agent.*

Vladivostock, *July 8, 1902.*

TURKEY IN ASIA.[a]

ALEXANDRETTA.

There are no creameries in this district (vilayets of Adana and Aleppo) and no prospects for any.

The Government gives no encouragement to such enterprises.

Alexandretta is the chief entrepôt for a large region, 30,000 to 40,000 square miles, extending to the Euphrates River, with a great number of cattle, but usually of poor and inferior breeds.

Wm. Ross Davis, *Consul.*

Alexandretta, *May 21, 1902.*

BEIRUT.

There are no creameries in this country. The native consumption of what we call butter is very limited, fruit and vegetables and certain native cheeses taking the place thereof. Cows are raised as much for their usefulness as draft animals as for their milk-producing capacity.

G. Bie Ravndal, *Consul.*

Beirut, *June 6, 1902.*

ERZERUM.

There are no creameries, cooperative or other, in this district.

No cream, cheese, or butter, as made in the United States, is manufactured or used in this district.

There are no prospects whatever for enterprises in the line of creameries.

No encouragement is given this industry by the Government.

Leo Bergholz, *Consul.*

Erzerum, *May 31, 1902.*

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[a] All duties in Turkey in Asia are 8 per cent.

HARPUT.

CREAMERIES AND CONSUMPTION.

No creameries exist in this district.

There is a fairly large consumption of butter in this region, chiefly for cooking purposes, as it rarely appears on the table. One limitation to the consumption is caused by the entire abstinence during Lent, on the part of the Armenian population, from every article of food of animal origin.

Another limitation is due to the extended use for culinary purposes of the fat of the tails of the Turkish sheep.

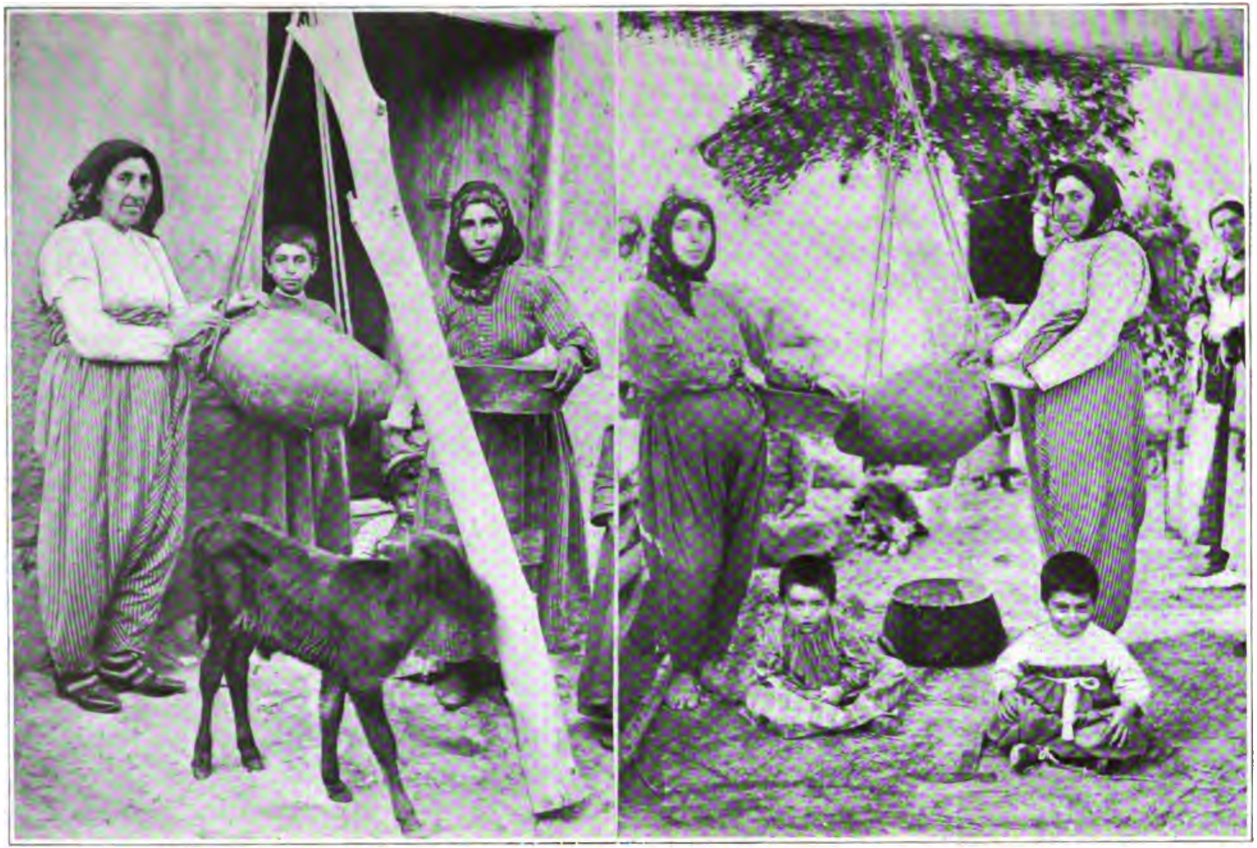
BUTTER MAKING.

Butter is made here exclusively from the thickened milk, known as "yaoort." No attempt is made here to collect cream and use it for butter making. In fact, on account of the failure to provide abundant succulent pasturage for cattle, but little cream separates from the milk ordinarily obtained in this country. A brief account of the method employed may be of interest to American dairymen, and possibly suggestive.

Fresh milk is heated in kettles to the boiling point and then allowed to cool to a temperature of about 80° F. At this point, yaoort a day or two old is added in the proportion of 1 tablespoonful to a quart of the milk. It is thoroughly stirred in. The temperature is maintained at 80° for three or four hours. The fermented mass is then placed in a cool place and allowed to stand for twenty-four hours. When old yaoort is not readily procured to start the lactic acid fermentation, the juice of the wild sumach berries is employed.

The thickened mass thus obtained, the yaoort, is largely used throughout the Orient as a food. It has the consistency of a custard without whey, or of "junket," and a slight acid taste. It is highly nutritious, easily digested, and very refreshing in warm weather. It is used in the preparation of various Turkish dishes, both meats and vegetables. As a rule, foreigners settling in Turkey become very fond of this preparation.

When used as the basis of butter making, the yaoort, usually prepared from sheep's milk, is introduced into either a goatskin or an earthen jar suspended by cords. Sufficient hot water is added to raise the temperature to about 80° F. The opening is tightly closed and the "churn" is kept in agitation with a jerky movement for about forty minutes before the butter forms. The accompanying photographs portray this important feature in the domestic life of this region. The butter thus prepared is white and curdy in appearance. The best quality retails at 21½ cents per pound.



BUTTER MAKING IN ASIA MINOR.

In order to illustrate the advantages of American dairy utensils, some months since I had a dash churn constructed, and the working has frequently been exhibited to those visiting the consulate. Yaoort, prepared from cow's milk, was employed. The advantages over the primitive method, used from time immemorial, were strikingly evident. Firm, yellow butter is obtained in seven to eight minutes. This butter is nearly equal to the English and Danish butter brought here in tins. Twelve quarts of yaoort yield 2½ pounds of butter.

The "airan," or residual buttermilk, is sold regularly in the market. It is a most refreshing drink in summer, and is used in the kitchen where an American cook would employ sour milk or buttermilk. It is sometimes termed "the wine of the Turks."

GOVERNMENT ENCOURAGEMENT.

No special encouragement is given by the Government to the development of dairy interests. Constantinople, the capital of the Empire, imports most of its butter from Siberia, instead of favoring production in the pastoral regions of the Empire.

DUTIES.

The import duty on dairy machinery is 8 per cent of the value. Should proper representations be made to the Imperial Government, is probable that an order could be secured admitting for a term of years such machinery free of duty. This is now the case for most classes of agricultural implements not easily manufactured by native artisans.

PROSPECT FOR NEW ENTERPRISES.

A graduate of an American agricultural college, who owns a large well-watered property near Harput, is planning to establish a creamery and introduce American methods of manufacturing both butter and cheese. He would gladly act as an agent for firms desiring to introduce dairy machinery in this section. Catalogues and correspondence relative thereto can be directed to this consulate.

The pastoral wealth of this and the adjoining provinces of eastern Turkey is very great. Skins are largely exported. Wool and its manufactured products, such as rugs, are exported to a limited extent. There is no reason why dairy products should not constitute an important article of export to the cities on the seacoast and elsewhere.

THOMAS H. NORTON, *Consul.*

HARPUT, *July 7, 1902.*[a]

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[a] Post-office address, Mezreh, Mamouret-ul-Aziz, Turkey.

JERUSALEM.

No creameries exist in Palestine. From April to November no rain falls, consequently there is no grass for cattle to eat. Only a very poor quality of butter is made. Milk, butter, and meats are all inferior. An attempt was made within the last four years by some farmers from Michigan to start a dairy business here, but without success. Fodder had to be bought the year round for the cows, and for six months water had to be bought; moreover, a guard had to be kept over the cows night and day, and the business was a losing one. Most of the butter used for the table here by foreigners is Swedish tinned butter, prepared by Morton, of London.

SELAH MERRILL, *Consul.*

JERUSALEM, *May 20, 1902.*

SIVAS.

There are no creameries in this consular district. The quantity of cream separated and consumed is insignificant. Butter is not made here from cream, but the milk is first converted into "yogurt"[a] by lactic acid fermentation and then churned.

PROSPECTS FOR NEW ENTERPRISES.

The prospects for new enterprises in this line are not inviting, owing to conservatism, ignorance, poverty, absence of demand, lack of transportation facilities, etc.

GOVERNMENT ENCOURAGEMENT.

The Government has established some "model farms," which are intended to educate the people in better and more profitable ways of agriculture, but as yet they have had no important effect in this region.

OUTLOOK FOR AMERICAN MACHINERY.

At present, I would not advise United States manufacturers to attempt to establish special agencies or plants for this line of goods in this region. If very cheap and simple separators and churns could be introduced, through existing agencies at Constantinople and Samsoun, they might in time create a demand.

MILO A. JEWETT, *Consul.*

SIVAS, *May 24, 1902.*

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[a] The consul at Harpoot calls this "yaoort."

SMYRNA.

CREAMERIES AND OUTPUT.

There is one small creamery operating in the city which uses modern machinery and prepares pasteurized milk of good quality. The output of this creamery is very limited and it works under many difficulties, chief of which is the high price of ice. During the five months of summer, the creamery is usually closed.

CONSUMPTION.

The daily consumption of milk in Smyrna is roughly estimated at 3,000 gallons. This is derived chiefly from goats that are driven from door to door and milked in the presence of the customer. Milk is also brought in from the country on donkeys' backs, a large can being strapped on either side of the saddle, and delivered from house to house.

Butter is made in the interior by shaking the sour cream in skin bags. Very little table butter is used and that little is generally imported in small sealed tins.

MACHINERY IN USE.

A few modern churns are finding their way into the country, but other creamery machinery will find little use until ice is produced in larger quantities and at moderate prices.

RUFUS W. LANE, *Consul.*

SMYRNA, *June 4, 1902.*

AFRICA.

ALGERIA.

There are no creameries in Algeria of any kind.

Practically all of the butter, cheese, and other milk products come from France. As the French butter consumed in Algiers is made without salt and can be kept but a few days, it is necessary to have an almost daily supply. During the strike of the dock laborers in Marseilles, about two years ago, no butter could be obtained in Algiers for several days.

In my opinion, there is no prospect for the introduction of American creamery machinery in Algeria, as the pasturage is not sufficiently good to produce rich milk.

Goat's milk is extensively consumed in the rural districts, especially by the natives, and camel's milk is used by the desert tribes.

DANIEL S. KIDDER, *Consul.*

ALGIERS, *May 8, 1902.*

CANARY ISLANDS.

There are no creameries in my district, the number of cows being insignificant and limited to a few small private farms. The milk used is mostly obtained from goats.

Butter is not largely consumed, and beyond the small quantities made on the farms above mentioned, the supply is imported from England in ½, 1, 2, 7, and 14 pound tins; it is of Danish and Irish origin.

Cheese is made from goat's milk, and is also imported, namely, from Switzerland, France, and England.

Condensed milk and cream are used to a great extent and are imported from England.

SOLOMON BERLINER,
Consul.

TENERIFFE, *May 22, 1902.*

EGYPT.

CREAMERIES AND OUTPUT.[a]

The number of creameries, cooperative and other, in Egypt, is between 20 and 25, nearly all being private dairy enterprises. There are no cooperative dairies and the only company is the Aboukir Dairy Company. As each fellaheen has a more or less wholesome distrust of his neighbor, cooperation is scarcely to be expected. However, the methods usually employed in the country really supply the place of cooperative creameries. The owner of the dairy has a center where butter is made and it absorbs the surplus milk supply of the surrounding villages. If the village is at some distance, he establishes a branch, furnishing it with a separator. The cream is sent to the central office and the seller retains the separated milk. The chief market is among the European community and winter is the season of greatest demand. At this season the daily output of all the dairies may be put at 1,500 kilos (3,307 pounds) per day; in summer less than one-third of this quantity is made. About 1,500,000 kilos (3,306,000 pounds) of butter are annually imported.

The number of creameries does not seem equal to the demand. Egypt is far from being a dairy country; except near Alexandria and Cairo, dairy farming is almost unknown, the growing of cotton and other crops being more profitable than feeding animals for milk. The native cow gives very little milk, and the buffalo milk yields a poor quality of butter. More creameries are constantly being established for the collection of the surplus milk of the villages. The large land owner is taking to breeding his own cattle, and he will find it necessary to utilize his surplus milk.

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[a] Egyptian duty 8 per cent.

GOVERNMENT ENCOURAGEMENT.

The Government gives no special encouragement to this industry.

MACHINERY IN USE.

Prevailing prices on dairy machinery are, of course, somewhat high. The Dairy Supply Company, England, is the largest exporter of dairy utensils to Egypt. The orders are usually sent direct and goods supplied at catalogue prices with the additional import expenses.

JOHN G. LONG,
Agent and Consul-General.

CAIRO, *June 14, 1902.*

MADAGASCAR.

CREAMERIES AND OUTPUT.

At present, under the stimulus of the French Government and with the increasing demand by foreigners for dairy produce, a beginning is being made, and there has recently been established at the capital what is known as "The Créamerie Centrifuge de Tananarive." There are besides about a score of cream separators in the whole island; these without exception are very small and mainly come from France.

On May 24 last, an agricultural show was held at Antananarivo, the first of the kind worthy of the name, and the governor-general in his opening speech said:

> The dairy industry, although very restricted up to the present, provides, nevertheless, an exhibition of produce quite remarkable, especially the butter produced by Rafaralahy, which notably has attracted the attention of visitors.

In the report of the same fair published in the Official Gazette last month, the reference to dairy produce is expressed in the following paragraph:

> The dairy produce which formed the first section of agricultural products comprised some very interesting exhibits, among which were butters of agreeable and fine flavor shown by natives, and cheeses of the Brie and Camenbert kind, which yielded no points to the European models. These were produced by Messrs. Couesnon and Lamboley.

It will thus be seen that in the general efforts made by the French Government to rouse the dormant possibilities of the country, this industry is not forgotten; but still it is in its infancy.

OUTLOOK FOR AMERICAN MACHINERY.

As to the possibility of American manufacturers introducing their machinery, I can only point out that the whole question hinges on the general conditions of the country. That Madagascar is abundantly rich in cattle, pretty well distributed over the island, is an undoubted fact, since it permits of a steady export to the neighboring colonies of Mauritius, Reunion, and South Africa. Thus the essential element for creamery establishments is here. In the face of this, the annual imports of the products under consideration, taking the latest statistics at hand, were, butter, $28,932; cheese, $21,946, and condensed milk, $32,166. Consequently, the actual consumption would at once warrant a home supply of $80,000 per annum of dairy produce. Given, then, the existence of sufficient cattle and a demand for the produce, the remaining needful conditions are more flattering inducements to foreigners to settle and engage in agricultural pursuits. But thus far, Madagascar appears to have few attractions of that nature even for Frenchmen, and there would seem to be no immediate prospect of a development sufficient to arouse the attention of our importers of machinery.

This does not, however, preclude the possibility of introducing a limited quantity of the smaller machines of the cream separator type. The very fact of this being a budding industry in a new colony ought to encourage some one to attempt to be first in the field. But the only method by which our country's goods could be successfully introduced here is the commercial traveler system—producing samples on the spot. In a country like Madagascar, where the majority of the colonists are illiterate, or those that can read only read French, our elaborate catalogues in the English language are useless. What is required here is a vessel equipped to visit the ports of Madagascar and make known certain specialties to colonists on their ranches, with the probability of selling for cash to a class of people who are utterly ignorant of corresponding with firms abroad, but who are not without ready money to purchase. This kind of transaction would doubtless meet with considerable success among the creole settlers who have never been out of the country and who should be educated to modern ideas.

DUTIES.

As far as present customs regulations exist, all machinery coming within the scope of this subject is classed as agricultural machinery and pays an import duty of 79 cents per 100 pounds gross weight.

WILLIAM A. HUNT, *Consul.*

TAMATAVE, *June 16, 1902.*

SENEGAL.

Butter and cheese are used freely among the civilized inhabitants of this colony, but the country does not produce them. Cattle are numerous in the colony, but as the calves are mostly raised, they consume the milk until a late period, and no attempt is made to develop the lacteal capabilities of the cows.

The butter used is imported from France. For table purposes the kind mostly used is the delicious fresh butter so prevalent in France, which comes here principally in 1-pound tins, which are retailed at about 50 cents for each tin. The fresh butter will keep in the tins for perhaps a month, and usually for a week after being opened. Salt butter, which is much less wholesome in a hot climate, is not much used in the colony except for cooking purposes.

Sterilized milk in tins from France is used to quite an extent, and so is condensed milk.

Cheese is largely used and is generally dear. Pâte grasse retails at about 60 cents per kilo (2.2046 pounds), and other kinds in proportion.

These articles are brought from France, in about a week, by the fast Messageries Maritimes steamers. American dairy products could not compete with them without direct transit, the means for which does not at present exist.

P. STRICKLAND, *Consul.*

GORÉE-DAKAR, *May 29, 1902.*

TUNIS.

There are no creameries in this consular district. All dairy products, such as butter, cheese, and the like, are brought into the country, for the most part from Italy.

The pasturage all over Tunis is very poor, and as droughts are of frequent occurrence cattle raising may be classed, practically, as nonexistent. Goat's milk is used in the cities, the goats being driven in from the suburbs twice a day and milked at the consumers' doors. The masses of the population do not eat butter. Olive oil, which is the principal product of this country, is used almost to the exclusion of all other alimentary fats.

ST. L. A. TOUHAY,
Vice-Consul.

TUNIS, *May 9, 1902.*

POLYNESIA.

NEW CALEDONIA.

There was one creamery in New Caledonia, at the town of Ouinane, but this has recently been closed, as it proved to be an unprofitable able enterprise.

At the moment, therefore, there is no output, nor do the prospects for new enterprises in this line seem very bright, owing especially to the lack of transportation facilities upon the island, and no encouragement being given to the industry by the Government.

The duty on dairying machinery coming from France is 5 per cent, and on machinery of the kind coming from other countries varies, being about 25 per cent.

At present, butter is imported in tins and milk in general is supplied locally.

There does not seem to be a demand for the production of creamery supplies upon the island, nor does it seem probable that this machinery could find a market here.

George M. Colvocoresses,
Commercial Agent.

Noumea, *June 27, 1902.*

SAMOA.

The milk obtained here is poor in quality, high priced, and very scarce. This is owing to the limited area of good pasture land and the indifference of the natives toward the raising of cattle. Milk sells at 8 to 10 cents a quart, but being frequently adulterated with water or cocoanut milk, many consumers prefer condensed milk as a substitute.

No creamery exists in these islands and, under prevailing conditions, no encouragement can be offered for the establishment of such an enterprise. All butter used in Samoa is imported exclusively from Auckland, New Zealand, except a small quantity of about 500 pounds per year, which is made by a few planters for their own consumption. In 1901, the shipments of butter from Auckland consisted of 40 cases of 72 1-pound tins and 24 kegs of 50 pounds each. The price in Auckland fluctuates from 24 cents to 30 cents per pound tin and for keg butter from 22 to 26 cents per pound.

The freight by steamer for 40 cubic feet is, inclusive of landing, from Auckland, $10.95; from San Francisco, $14.

Imported machinery is subject to a duty of 10 per cent on invoice cost, and freight.

Geo. Heimrod,
Consul-General.

Apia, *June 4, 1902.*

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VOL. XXV.

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Following are the special publications issued by the Bureau prior to 1890:

Labor in Europe, 1878, one volume; Labor in Foreign Countries, 1884, three volumes; Commerce of the World and the Share of the United States Therein, 1879; Commerce of the World and the Share of the United States Therein, 1880–81; Declared Exports for the United States, First and Second Quarters, 1883; Declared Exports for the United States, Third and Fourth Quarters, 1883; Cholera in Europe in 1884, 1885; Trade Guilds of Europe, 1885; The Licorice Plant, 1885; Forestry in Europe, 1887; Emigration and Immigration, 1885–86 (a portion of this work was published as CONSULAR REPORTS No. 76, for the month of April, 1887); Rice Pounding in Europe, 1887; Sugar of Milk, 1887; Wool Scouring in Belgium, 1887; Cattle and Dairy Farming in Foreign Countries, 1888 (issued first in one volume, afterwards in two volumes); Technical Education in Europe, 1888; Tariffs of Central America and the British West Indies, 1890.

The editions of all these publications except Tariffs in Central America, etc., are exhausted and the Department is, therefore, unable to supply copies.

In 1890, the Department decided to publish reports on special subjects in separate form, to be entitled SPECIAL CONSULAR REPORTS. There are now the following SPECIAL CONSULAR REPORTS:

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* Formerly Bureau of Statistics. Name changed to Bureau of Foreign Commerce by order of the Secretary of State, July 1, 1897.

Vol. 9 (1892 and 1893).—Australian Sheep and Wool and Vagrancy and Public Charities in Foreign Countries.

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Vol. 16 (1899).—Tariffs of Foreign Countries. Part I. Europe. Part II. America. Part III. Asia, Africa, Australasia, and Polynesia. Supplement (1900). Tariffs of Chile and Nicaragua.

Vol. 17 (1899).—Disposal of Sewage and Garbage in Foreign Countries; Foreign Trade in Coal Tar and By-Products.

Vol. 18 (1900).—Merchant Marine of Foreign Countries.

Vol. 19 (1900).—Paper in Foreign Countries; Uses of Wood Pulp.

Vol. 20 (1900).—Part I. Book Cloth in Foreign Countries, Market for Ready-Made Clothing in Latin America, Foreign Imports of American Tobacco, and Cigar and Cigarette Industry in Latin America. Part II. School Gardens in Europe. Part III. The Stave Trade in Foreign Countries.

Vol. 21 (1900).—Part I. Foreign Markets for American Coal. Part II. Vehicle Industry in Europe. Part III. Trusts and Trade Combinations in Europe.

Vol. 22 (1900 and 1901).—Part I. Acetic Acid in Foreign Countries. Part II. Mineral-Water Industry. Part III. Foreign Trade in Heating and Cooking Stoves.

Vol. 23 (1901).—Part I. Gas and Oil Engines in Foreign Countries. Part II. Silver and Plated Ware in Foreign Countries.

Vol. 24 (1902).—Creameries in Foreign Countries.

Vol. 25 (1902).—Stored Goods as Collateral for Loans.

Of these Special Consular Reports, Australian Sheep and Wool, Cotton Textiles in Foreign Countries, Files in Spanish America, Fire and Building Regulations, Fruit Culture, Gas in Foreign Countries, India Rubber, Lead and Zinc Mining, Malt and Beer in Spanish America, Port Regulations, Refrigerators and Food Preservation; Sericulture, etc.; Vagrancy, etc., are exhausted, and no copies can be supplied by the Department.

There was also published, in 1899, Proclamations and Decrees during the War with Spain, comprising neutrality circulars issued by foreign countries, proclamations by the President, orders of the War and Navy Departments, and war decrees of Spain.

Of the monthly Consular Reports, many numbers are exhausted or so reduced that the Department is unable to accede to requests for copies. Of the publications of the Bureau available for distribution, copies are mailed to applicants without charge. In view of the scarcity of certain numbers, the Bureau will be grateful for the return of any copies of the monthly or special reports which recipients do not care to retain. Upon notification of willingness to return such copies, the Department will forward franking labels to be used in lieu of postage in the United States, Canada, the Hawaiian Islands, Porto Rico, and Mexico.

Persons receiving Consular Reports regularly, who change their addresses, should give the old as well as the new address in notifying the Bureau of the fact.

In order to prevent confusion with other Department bureaus, all communications relating to consular reports should be carefully addressed, "Chief, Bureau of Foreign Commerce, Department of State, Washington, U. S. A."

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VALUES OF FOREIGN COINS AND CURRENCIES.

The following statements show the valuation of foreign coins, as given by the Director of the United States Mint and published by the Secretary of the Treasury, in compliance with the first section of the act of March 3, 1873, viz: "That the value of foreign coins, as expressed in the money of account of the United States, shall be that of the pure metal of such coin of standard value," and that "the value of the standard coins in circulation of the various nations of the world shall be estimated annually by the Director of the Mint, and be proclaimed on the 1st day of January by the Secretary of the Treasury."

In compliance with the foregoing provisions of law, annual statements were issued by the Treasury Department, beginning with that issued on January 1, 1874, and ending with that issued on January 1, 1890. Since that date, in compliance with the act of October 1, 1890, these valuation statements have been issued quarterly, beginning with the statement issued on January 1, 1891.

The fact that the market exchange value of foreign coins differs in many instances from that given by the United States Treasury has been repeatedly called to the attention of the Bureau of Foreign Commerce. An explanation of the basis of the quarterly valuations was asked from the United States Director of the Mint, and under date of February 7, 1898, Mr. R. E. Preston made the following statement:

"When a country has the single gold standard, the value of its standard coins is estimated to be that of the number of grains fine of gold in them, 480 grains being reckoned equivalent to $20.67 in United States gold, and a smaller number of grains in proportion. When a country has the double standard, but keeps its full legal-tender silver coins at par with gold, the coins of both gold and silver are calculated on the basis of the gold value.

"The value of the standard coins of countries with the single silver standard is calculated to be that of the average market value of the pure metal they contained during the three months preceding the date of the proclamation of their value in United States gold by the Secretary of the Treasury. The value of the gold coins of silver-standard countries is calculated at that of the pure gold they contain, just as if they had the single gold standard.

"These valuations are used in estimating the values of all foreign merchandise exported to the United States."

The following statements, running from January 1, 1874, to October 1, 1902, have been prepared to assist in computing the values in American money of the trade, prices, values, wages, etc., of and in foreign countries, as given in consular and other reports. The series of years are given so that computations may be made for each year in the proper money values of such year. In hurried computations, the reductions of foreign currencies into American currency, no matter for how many years, are too often made on the bases of latest valuations. All computations of values, trade, wages, prices, etc., of and in the "fluctuating-currency countries" should be made in the values of their currencies in each year up to and including 1898, and in the quarterly valuations thereafter.

To meet typographical requirements, the quotations for the years 1875–1877, 1879–1882, 1884–1887, 1895, and 1897 are omitted, these years being selected as showing the least fluctuations when compared with years immediately preceding and following.

To save unnecessary repetition, the estimates of valuations are divided into three classes, viz: (A) countries with fixed currencies, (B) countries with fluctuating currencies, and (C) quarterly valuations of fluctuating currencies.

A.—*Countries with fixed currencies.*

The following official (United States Treasury) valuations of foreign coins do not include "rates of exchange."

Countries.	Standard.	Monetary unit.	Value in U.S.gold.	Coins.
Argentine Republic	Gold and silver	Peso	$0.96,5	Gold—argentine ($4.82,4) and ½ argentine; silver—peso and divisions.
Austria-Hungary*	Gold	Crown	.20,3	Gold—20 crowns ($4.05,2) and 10 crowns.
Belgium	Gold and silver	Franc	.19,3	Gold—10 and 20 franc pieces; silver—5 francs.
Brazil	Gold	Milreis	.54,6	Gold—5, 10, and 20 milreis; silver—½, 1, and 2 milreis.
British North America (except Newfoundland).	do	Dollar	1.00	
British Honduras	do	do	1.00	
Chile	do	Peso	.36,5	Gold—escudo ($1.25), doubloon ($3.65), and condor ($7.30); silver—peso and divisions.
Costa Rica	do	Colon	.46,5	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centisimos.
Cuba	Gold and silver	Peso	.92,6	Gold—doubloon ($5.01,7); silver—peso (60 cents).
Denmark	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Ecuador †	do	Sucre	.48,7	Gold—10 sucres ($4.8665); silver—sucre and divisions.
Egypt	do	Pound (100 piasters).	4.94,3	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10, and 20 piasters.
Finland	do	Mark	.19,3	Gold—10 and 20 marks ($1.93 and $3.85,9).
France	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany	Gold	Mark	.23,8	Gold—5, 10, and 20 marks.
Great Britain	do	Pound sterling.	4.86,6½	Gold—sovereign (pound sterling) and half sovereign.
Greece	Gold and silver	Drachma	.19,3	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti	do	Gourde	.96,5	Silver—gourde.
India ‡	Gold	Rupee	.32,4	Gold—sovereign ($4.8665); silver—rupee and divisions.
Italy	Gold and silver	Lira	.19,3	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan §	Gold	Yen	.49,8	Gold—1, 2, 5, 10, and 20 yen.
Liberia	do	Dollar	1.00	
Netherlands	Gold and silver	Florin	.40,2	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland	Gold	Dollar	1.01,4	Gold—$2 ($2.02,7).
Peru ‖	do	Sol	.48,7	Gold—libra ($4.8665); silver—sol and divisions.
Portugal	do	Milreis	1.08	Gold—1, 2, 5, and 10 milreis.
Russia ¶	do	Ruble	.51,5	Gold—imperial ($7.718) and ½ imperial ($3.80); silver—¼, ½, and 1 ruble.
Spain	Gold and silver	Peseta	.19,3	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway.	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Switzerland	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey	Gold	Piaster	.04,4	Gold—25, 50, 100, 200, and 500 piasters.
Uruguay	do	Peso	1.03,4	Gold—peso; silver—peso and divisions.
Venezuela	Gold and silver	Bolivar	.19,3	Gold—5, 10, 20, 50, and 100 bolivars; silver—5 bolivars.

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* The gold standard went into effect January 1, 1900 (see Commercial Relations, 1899, Vol. II, p. 7). Values are still sometimes expressed in the florin, which is worth 2 crowns.

† Gold standard adopted in November, 1900. (See CONSULAR REPORTS No. 225, June, 1899.)

‡ For an account of the adoption of the gold standard, see CONSULAR REPORTS No. 238, p. 359.

§ Gold standard adopted October 1, 1897. (See CONSULAR REPORTS No. 201, p. 259.)

‖ Gold standard adopted October 13, 1900.

¶ For an account of the adoption of the gold standard, see Review of the World's Commerce, 1896–97, p. 254.

B.—*Countries with fluctuating currencies, 1874–1898.*

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1874.	1878.	1883.	1888.	1889.	1890.
Austria-Hungary*.	Silver	Florin	$0.47,6	$0.45,3	$0.40,1	$0.34,5	$0.33,6	$0.42
Bolivia	do	Dollar until 1880; boliviano thereafter.	.96,5	.96,5	.81,2	.69,9	.68	.85
Central America	do	Peso	.96,5	.91,8	....	.69,9	.68	.85
China	do	Haikwan tael	1.61	....	....	....	....	....
Colombia	do	Peso	.96,5	.96,5	.81,2	.69,9	.68	.85
Ecuador	do	do	.96,5	.91,8	.81,2	.69,9	.68	.85
Egypt†	Gold	Pound (100 piasters).	....	4.97,4	4.90	4.94,3	....	....
India	Silver	Rupee	.45,8	.43,6	.38,6	.32,2	.32,3	.40,4
Japan	Gold	Yen	.99,7	.99,7	....	.99,7	.99,7	.99,7
	Silver		....	....	.87,6	.75,3	.73,4	.91,7
Mexico	do	Dollar	1.04,75	.99,8	.88,2	.75,9	.73,9	.92,3
Netherlands‡	Gold and Silver.	Florin	.40,5	.38,5	....	....	....	....
Peru	Silver	Sol	.92,5	.91,8	.81,2	.69,9	.68	.85
Russia	do	Ruble	.77,17	.73,4	.65	.55,9	.54,4	.68
Tripoli	do	Mahbub of 20 piasters.	.87,09	.82,9	.73,3	.63	.61,4	.76,7

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1891.	1892.	1893.	1894.	1896.	1898.
Austria-Hungary*.	Silver	Florin	$0.38,1	$0.34,1	....	....	....	....
Bolivia	do	Boliviano	.77,1	.69,1	$0.61,3	$0.51,6	$0.49,1	$0.42,4
Central America	do	Peso	.77,1	.69,1	.61,3	.51,6	.49,1	.41,4
Colombia	do	do	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
Ecuador	do	do	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
India	do	Rupee	.36,6	.32,8	.29,2	.24,5	.23,3	.20,1
Japan§	do	Yen	.83,1	.74,5	.66,1	.55,6	.52,9	....
Mexico	do	Dollar	.83,7	.75	.66,6	.56	.53,3	.46
Peru	do	Sol	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
Russia§	do	Ruble	.61,7	.55,3	.49,1	.41,3	.39,3	....
Tripoli	do	Mahbub of 20 piasters.	.69,5	.62.3	.55,3	.46,5	.44,3	....

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* The silver standard prevailed in Austria-Hungary up to 1892. The law of August 2 of that year (see CONSULAR REPORTS No. 147, p. 623) established the gold standard.

† The Egyptian pound became fixed in value at $4.94,3 in 1887.

‡ The Netherlands florin fluctuated up to the year 1880, when it became fixed at 40.2 cents.

§ See footnote, table of fixed currencies.

C.—*Quarterly valuations of fluctuating currencies.*

Countries.	Monetary unit.	1899.				1900.			
		Jan. 1.	April 1.	July 1.	Oct. 1.	Jan. 1.	April 1.	July 1.	Oct. 1.
Bolivia	Silver boliviano.	$0.43,9	$0.43,4	$0.44,3	$0.43,6	$0.42,7	$0.43,6	$0.43,8	$0.45,1
Central America.	Silver peso	.43,9	.43,4	.44,3	.43,6	.42,7	.43,6	.43,8	.45,1
China	Amoy tael	.71	.70,2	.71,6	.70,5	.69,1	.70,5	.70,9	.72,9
	Canton tael	.70,8	.70	.71,4	.70,3	.68,9	.70,3	.70,7	.72,7
	Chefoo tael	.67,9	.67,2	.68,4	.67,4	.66,1	.67,4	.67,8	.69,7
	Chinkiang tael	.69,3	.68,6	.69,9	.68,9	.67,5	.68,8	.69,3	.71,2
	Fuchau tael	.65,6	.65	.66,2	.65,2	.64	.65,2	.65,6	.67,4
	Haikwan tael	.72,2	.71,4	.72,8	.71,8	.70,3	.71,7	.72,1	.74,2
	Hankau tael	.66,4	.65,7	.67	.66	.64,7	.65,9	.66,3	.68,2
	Hongkong tael	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	Ningpo tael	.68,2	.67,5	.68,8	.67,8	.66,5	.67,7	.68,2	.70,1
	Niuchwang tael.	.66,5	.65,9	.67,1	.66,1	.64,8	.66,1	.66,5	.68,4
	Shanghai tael	.64,8	.64,1	.65,4	.64,4	.63,1	.64,4	.64,8	.66,6
	Swatow tael	.65,5	.64,9	.66,1	.65,1	.63,9	.65,1	.65,5	.67,4
	Takao tael	.71,4	.70,7	.72	.71	.69,6	.70,9	.71,4	.73,4
	Tientsin tael	.68,8	.68	.69,4	.68,3	.67	.68,3	.68,7	.70,7
Colombia	Silver peso	.43,9	.43,4	.44,3	.43,6	.42,7	.43,6	.43,8	.45,1
Ecuador †	do	.43,9	.43,4	.44,3	.43,6	…………	…………	…………	…………
India	Silver rupee‡	.20,8	.20,6	.21	.20,7	.20,3	.20,7	.20,8	…………
Mexico	Silver dollar	.47,7	.47,2	.48,1	.47,4	.46,4	.47,3	.47,6	.49
Persia	Silver kran	.08,1	.08	.08,2	.08	.07,9	.08	.08,1	.08,3
Peru †	Silver sol	.43,9	.43,4	.44,3	.43,6	.42,7	.43,6	.43,8	.48,7

Countries.	Monetary unit.	1901.				1902.			
		Jan. 1.	April 1.	July 1.	Oct. 1.	Jan. 1.	April 1.	July 1.	Oct. 1.
Bolivia	Silver boliviano.	$0.46,8	$0.45,1	$0.43,6	$0.42,8	$0.41,3	$0.40,3	$0.38,2	$0.38,4
Central America.	Silver peso	.46,5	.45,1	.43,6	.42,8	.41,3	.40,3	.38,2	.38,4
China	Amoy tael	.75,7	.72,9	.70,5	.69,1	.66,9	.65,1	.61,8	.62
	Canton tael	.75,5	.72,7	.70,3	.68,9	.66,7	.64,9	.61,7	.61,9
	Chefoo tael	.72,4	.69,7	.67,4	.66,1	.63,9	.62,3	.59,1	.59,3
	Chinkiang tael	.74	.71,2	.68,8	.67,5	.65,3	.63,6	.60,4	.60,6
	Fuchau tael	.70,1	.67,5	.65,2	.64	.61,8	.60,2	.57,2	.57,4
	Haikwan tael	.77,1	.74,2	.71,7	.70,4	.68	.66,3	.62,9	.63,1
	Hankau tael	.70,9	.68,2	.65,9	.64,7	.62,6	.60,9	.57,9	.58
	Hongkong tael	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	Ningpo tael	.72,8	.70,1	.67,8	.66,5	.64,3	.62,6	.59,5	.59,6
	Niuchwang tael.	.71	.68,4	.66,1	.64,8	.62,7	.61,1	.58	.58,2
	Shanghai tael	.69,2	.66,6	.64,4	.63,2	.61,1	.59,5	.56,5	.56,7
	Swatow tael	.70	.67,4	.65,1	.63,9	.61,8	.60,2	.57,1	.57,3
	Takao tael	.76,2	.73,4	.70,9	.69,6	.67,3	.65,5	.62,2	.62,4
	Tientsin tael	.73,4	.70,7	.68,3	.67	.64,8	.63,1	.59,9	.60,1
Colombia	Silver peso	.46,8	.45,1	.43,6	.42,8	.41,3	.40,3	.38,2	.38,4
Mexico	Silver dollar	.50,9	.49	.49	.46,4	.44,9	.43,7	.41,5	.41,7
Persia	Silver kran	.08,6	.08,3	.08,3	.07,9	.07,6	.07,4	.07	.07,1

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* The ' British dollar " has the same legal value as the Mexican dollar in Hongkong, the Straits Settlements, and Labuan.

† See footnote, table of fixed currencies.

‡ The sovereign is the standard coin of India, but the rupee is the money of account. See also table of fixed currencies.

FOREIGN WEIGHTS AND MEASURES.

The following table embraces only such weights and measures as are given from time to time in CONSULAR REPORTS and in Commercial Relations:

Foreign weights and measures, with American equivalents.

Denominations.	Where used.	American equivalents.
Almude	Portugal	4.422 gallons.
Ardeb	Egypt	7.6907 bushels.
Are	Metric	0.02471 acre.
Arobe	Paraguay	25 pounds.
Arratel or libra	Portugal	1.011 pounds.
Arroba (dry)	Argentine Republic	25.3175 pounds.
Do	Brazil	32.38 pounds.
Do	Cuba	25.3664 pounds.
Do	Portugal	32.38 pounds.
Do	Spain	25.36 pounds.
Do	Venezuela	25.4024 pounds.
Arroba (liquid)	Cuba, Spain, and Venezuela	4.263 gallons.
Arshine	Russia	28 inches.
Arshine (square)	do	5.44 square feet.
Artel	Morocco	1.12 pounds.
Baril	Argentine Republic and Mexico	20.0787 gallons.
Barrel	Malta (customs)	11.4 gallons.
Do	Spain (raisins)	100 pounds.
Berkovets	Russia	361.12 pounds.
Bongkal	India	832 grains.
Bouw	Sumatra	7,096.5 square meters
Bu	Japan	0.1 inch.
Butt (wine)	Spain	140 gallons.
Caffiso	Malta	5.4 gallons.
Candy	India (Bombay)	529 pounds.
Do	India (Madras)	500 pounds.
Cantar	Morocco	113 pounds.
Do	Syria (Damascus)	575 pounds.
Do	Turkey	124.7036 pounds.
Cantaro (cantar)	Malta	175 pounds.
Carga	Mexico and Salvador	300 pounds.
Catty	China	1.333$\frac{1}{3}$ (1$\frac{1}{3}$) pounds.
Do*	Japan	1.31 pounds.
Do	Java, Siam, and Malacca	1.35 pounds.
Do	Sumatra	2.12 pounds.
Centaro	Central America	4.2631 gallons.
Centner	Bremen and Brunswick	117.5 pounds.
Do	Darmstadt	110.24 pounds.
Do	Denmark and Norway	110.11 pounds.
Do	Nuremberg	112.43 pounds.
Do	Prussia	113.44 pounds.
Do	Sweden	93.7 pounds.
Do	Vienna	123.5 pounds.
Do	Zollverein	110.24 pounds.
Do	Double or metric	220.46 pounds.
Chetvert	Russia	5.7748 bushels.
Chih	China	14 inches.

*More frequently called "kin." Among merchants in the treaty ports it equals 1.33$\frac{1}{3}$ pounds avoirdupois.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Coyan	Sarawak	3,098 pounds.
Do	Siam (Koyan)	2,667 pounds.
Cuadra	Argentine Republic	4.2 acres.
Do	Paraguay	78.9 yards.
Do	Paraguay (square)	8.077 square feet.
Do	Uruguay	Nearly 2 acres.
Cubic meter	Metric	35.3 cubic feet.
Cwt. (hundredweight)	British	112 pounds.
Dessiatine	Russia	2.6997 acres.
Do	Spain	1.599 bushels.
Drachme	Greece	Half ounce.
Egyptian weights and measures	(*See* CONSULAR REPORTS NO. 144.)	
Fanega (dry)	Central America	1.5745 bushels.
Do	Chile	2.575 bushels.
Do	Cuba	1.599 bushels.
Do	Mexico	1.54728 bushels.
Do	Morocco	Strike fanega, 70 lbs.; full fanega, 118 lbs.
Do	Uruguay (double)	7.776 bushels.
Do	Uruguay (single)	3.888 bushels.
Do	Venezuela	1.599 bushels.
Fanega (liquid)	Spain	16 gallons.
Feddan	Egypt	1.03 acres.
Frail (raisins)	Spain	50 pounds.
Frasco	Argentine Republic	2.5096 quarts.
Do	Mexico	2.5 quarts.
Frasila	Zanzibar	35 pounds.
Fuder	Luxemburg	264.17 gallons.
Funt	Russia	0.9028 pound.
Garnice	Russian Poland	0.88 gallon.
Gram	Metric	15.432 grains.
Hectare	do	2.471 acres.
Hectoliter:		
Dry	do	2.838 bushels.
Liquid	do	26.417 gallons.
Joch	Austria-Hungary	1.422 acres.
Ken	Japan	6 feet.
Kilogram (kilo)	Metric	2.2046 pounds.
Kilometer	do	0.621376 mile.
Klafter	Russia	216 cubic feet.
Koku	Japan	4.9629 bushels.
Korree	Russia	3.5 bushels.
Kwan	Japan	8.28 pounds.
Last	Belgium and Holland	85.134 bushels.
Do	England (dry malt)	82.52 bushels.
Do	Germany	2 metric tons (4,480 pounds).
Do	Prussia	112.29 bushels.
Do	Russian Poland	11¼ bushels.
Do	Spain (salt)	4,760 pounds
League (land)	Paraguay	4,633 acres.
Li	China	2,115 feet.
Libra (pound)	Argentine Republic	1.0127 pounds
Do	Central America	1.043 pounds.
Do	Chile	1.014 pounds.
Do	Cuba	1.0161 pounds.
Do	Mexico	1.01465 pounds.
Do	Peru	1.0143 pounds.
Do	Portugal	1.011 pounds.
Do	Spain	1.0144 pounds.
Do	Uruguay	1.0143 pounds.
Do	Venezuela	1.0161 pounds.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Liter	Metric	1.0567 quarts.
Livre (pound)	Greece	1.1 pounds.
Do	Guiana	1.0791 pounds.
Load	England (timber)	Square, 50 cubic feet; unhewn, 40 cubic feet; inch planks, 600 superficial feet.
Manzana	Costa Rica	1¾ acres.
Do	Nicaragua and Salvador	1.727 acres.
Marc	Bolivia	0.507 pound.
Maund	India	82 2/7 pounds.
Meter	Metric	39.37 inches.
Mil	Denmark	4.68 miles.
Do	Denmark (geographical)	4.61 miles.
Milla	Nicaragua and Honduras	1.1493 miles.
Morgen	Prussia	0.63 acre.
Oke	Egypt	2.7225 pounds.
Do	Greece	2.84 pounds.
Do	Hungary	3.0817 pounds.
Do	Turkey	2.82838 pounds.
Do	Hungary and Wallachia	2.5 pints.
Pic	Egypt	21¼ inches.
Picul	Borneo and Celebes	135.64 pounds.
Do	China, Japan, and Sumatra	133⅓ pounds.
Do	Java	135.1 pounds.
Do	Philippine Islands.	137.9 pounds.
Pie	Argentine Republic	0.9478 foot.
Do	Spain	0.91407 foot.
Pik	Turkey	27.9 inches.
Pood	Russia	36.112 pounds.
Pund (pound)	Denmark and Sweden	1.102 pounds.
Quarter	Great Britain	8.252 bushels.
Do	London (coal)	36 bushels.
Quintal	Argentine Republic	101.42 pounds.
Do	Brazil	130.06 pounds.
Do	Castile,* Chile, Mexico, and Peru	101.41 pounds.
Do	Greece	123.2 pounds.
Do	Newfoundland (fish)	112 pounds.
Do	Paraguay	100 pounds.
Do	Syria	125 pounds.
Do	Metric	220.46 pounds.
Rotle	Palestine	6 pounds.
Do	Syria	5¾ pounds.
Sagene	Russia	7 feet.
Salm	Malta	490 pounds.
Se	Japan	0.02451 acres.
Seer	India	1 pound 13 ounces.
Shaku	Japan	11.9305 inches.
Sho	do	1.6 quarts.
Standard (St. Petersburg)	Lumber measure	165 cubic feet.
Stone	British	14 pounds.
Suerte	Uruguay	2,700 cuadras (see cuadra).
Sun	Japan	1.193 inches.
Tael	Cochin China	590.75 grains (troy).
Tan	Japan	0.25 acre.
To	do	2 pecks.
Ton	Space measure	40 cubic feet.
Tonde (cereals)	Denmark	3.94783 bushels.
Tondeland	do	1.36 acres.

*Although the metric weights are used officially in Spain, the Castile quintal is employed in commerce in the Peninsula and colonies, save in Catalonia; the Catalan quintal equals 91.71 pounds.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Tsubo	Japan	6 feet square.
Tsun	China	1.41 inches.
Tunna	Sweden	4.5 bushels.
Tunnland	Sweden	1.22 acres.
Vara	Argentine Republic	34.1208 inches.
Do	Central America	32.87 inches.
Do	Chile and Peru	33.367 inches.
Do	Cuba	33.384 inches.
Do	Curaçao	33.375 inches.
Do	Mexico	33 inches.
Do	Paraguay	34 inches.
Do	Spain	0.914117 yard.
Do	Venezuela	33.384 inches.
Vedro	Russia	2.707 gallons.
Vergees	Isle of Jersey	71.1 square rods.
Verst	Russia	0.663 mile.
Vlocka	Russian Poland	41.98 acres.

METRIC WEIGHTS AND MEASURES.

Metric weights.

Milligram ($\frac{1}{1000}$ gram) equals 0.0154 grain.
Centigram ($\frac{1}{100}$ gram) equals 0.1543 grain.
Decigram ($\frac{1}{10}$ gram) equals 1.5432 grains.
Gram equals 15.432 grains.
Decagram (10 grams) equals 0.3527 ounce.
Hectogram (100 grams) equals 3.5274 ounces.
Kilogram (1,000 grams) equals 2.2046 pounds.
Myriagram (10,000 grams) equals 22.046 pounds.
Quintal (100,000 grams) equals 220.46 pounds.
Millier or tonnea—ton (1,000,000 grams) equals 2,204.6 pounds.

Metric dry measures.

Milliliter ($\frac{1}{1000}$ liter) equals 0.061 cubic inch.
Centiliter ($\frac{1}{100}$ liter) equals 0.6102 cubic inch.
Deciliter ($\frac{1}{10}$ liter) equals 6.1022 cubic inches.
Liter equals 0.908 quart.
Decaliter (10 liters) equals 9.08 quarts.
Hectoliter (100 liters) equals 2.838 bushels.
Kiloliter (1,000 liters) equals 1.308 cubic yards.

Metric liquid measures.

Milliliter ($\frac{1}{1000}$ liter) equals 0.0388 fluid ounce.
Centiliter ($\frac{1}{100}$ liter) equals 0.338 fluid ounce.
Deciliter ($\frac{1}{10}$ liter) equals 0.845 gill.
Liter equals 1.0567 quarts.
Decaliter (10 liters) equals 2.6418 gallons.
Hectoliter (100 liters) equals 26.417 gallons.
Kiloliter (1,000 liters) equals 264.18 gallons.

Metric measures of length.

Millimeter ($\frac{1}{1000}$ meter) equals 0.0394 inch.
Centimeter ($\frac{1}{100}$ meter) equals 0.3937 inch.
Decimeter ($\frac{1}{10}$ meter) equals 3.937 inches.

Meter equals 39.37 inches.
Decameter (10 meters) equals 393.7 inches.
Hectometer (100 meters) equals 328 feet 1 inch.
Kilometer (1,000 meters) equals 0.62137 mile (3,280 feet 10 inches).
Myriameter (10,000 meters) equals 6.2137 miles.

Metric surface measures.

Centare (1 square meter) equals 1,550 square inches.
Are (100 square meters) equals 119.6 square yards.
Hectare (10,000 square meters) equals 2.471 acres.

INSTRUCTION TO CONSULAR OFFICERS.

In compliance with a request by the American Warehousemen's Association, a circular instruction was sent on May 27, 1902, to consular officers in certain foreign countries, requesting information as to the methods adopted in making loans on goods in warehouses. The association states that in the recent extraordinary growth of the storage business in this country there has developed an urgent need of some safe method by which the values in goods stored can be used as collateral for loans. Attempts to accomplish this through the issue of negotiable warehouse receipts have failed—except in cases dependent upon the faith of the banker in the individual warehouseman signing the receipt—on account of the fact that there is no supervision of warehouses (corporate, State, or national) on which bankers can depend for the existence of the collateral. A knowledge of foreign methods, it is added, will aid in the solution of this important question in the United States, as the principal commercial cities of Europe have systems, perfected by long experience, through which they are enabled to convert this class of goods into safe and valuable assets for banking purposes.

The answers follow.

STORED GOODS AS COLLATERAL FOR LOANS.

AUSTRIA-HUNGARY.

GENERAL REPORT.

The method adopted in Austria for making goods stored in warehouses available as collateral for loans is through the issue of negotiable warehouse certificates or receipts called "Lagerscheine," which may be made out to the depositor or to order. The supervision of warehouses by the Government and the strict regulations in reference thereto are sufficient surety to the banking house making the loan on the warehouse certificate, as to the actual existence of the goods for which the certificate is issued. This certificate, or receipt, must contain the name, business or position, and residence of the depositor of the goods, date of deposit, an exact description of special marks, brand, quality, quantity, and kind of the goods stored, with the further statement as to any insurance taken thereon, as also amount and duration thereof. The warehouse must keep a record of each certificate, and also of what is subsequently done with the stored goods, whether repacked, divided, transferred, mortgaged, taken partly or wholly out of storage, and other pertinent particulars.

FORM OF MORTGAGE.

On the certificate made out to order, a mortgage or loan may be negotiated by surrender of the warehouse receipt, indorsed like a check or note. It may be specially stated on the indorsement that the certificate has not been surrendered as a transfer of property, but solely as a lien on the same. When the indorsement shows also the amount and time for payment of the loan, the name, business, and residence of the creditor, and when, further, this statement is signed by the mortgagor, the holder of the certificate is entitled to satisfy his claim from the mortgaged goods without need of any other written agreement. The legal owner of the certificate, inasmuch as he does not appear from the indorsement solely as mortgagee, may ask that the stored goods be divided into any desired number of smaller lots, and in such case as many new receipts shall be executed as may correspond with the division of the goods. The stored goods are to be delivered by the warehouse upon return of the certificate, and only to the person who is shown by the contents of the certificate to have the right to dispose of the goods in question. When the time of payment designated in the indorsement on the mortgage certificate lapses, the warehouse is obliged to allow the immediate sale of the stored goods and, moreover, to facilitate the sale in every way. To the purchaser of the stored goods at a sale by the mortgagee, the warehouse delivers the goods solely upon presentation of the bill of sale and after payment—as far as the proceeds go—of duty, fees, storage, and other costs, and also of the mortgage claims shown in the certificate to attach to the goods. If a certificate is lost, the warehouse must make out a new one for the party in whose favor the same was effected.

Loans upon negotiable warehouse receipts or certificates are usually given on not more than 60 to 70 per cent of the total value of the stored goods; in rare cases, on as much as 80 per cent of said value. The commodities on which the loans are made are chiefly grain, sugar, oil, coffee, flour, cotton, and wool. Bankers generally have among their employees expert appraisers of goods on which loans are taken. The amount of this kind of banking business in Austria-Hungary averages, as I am informed by one of the principal banking houses in Vienna, about 200,000,000 crowns, or some $40,000,000, annually. This amount is likely to increase in the future, as it is intended to establish new public warehouses in several leading Austrian cities. The first large cold-storage warehouse has just been opened in Vienna, and the undertaking promises every success.

WAREHOUSES.

Permission to put up a warehouse is granted by the Ministry of Commerce, and may be obtained by individuals or corporations. Licensed public warehouses are of two kinds—warehouses where incoming dutiable goods are stored until duty is paid thereon or they are sent out of the country again, and warehouses where such goods as are not dutiable, or on which the duty has already been paid, are stored. As a rule, bonded warehouses may be erected only in the towns where there is a custom-house. General public warehouses may be erected anywhere, but are not usually placed in frontier districts. Applicants for license to erect public warehouses must show the requisite amount of capital for the contemplated enterprise, and the manner of procuring the necessary funds. In the application for license it must be stated, besides, whether business is to extend to dutiable goods, for which additional permission is required; and, further, the kind of security to cover possible claims by the customs authorities must be specified.

For purposes of supervision by customs authorities, the following regulations must be observed in the erection and management of bonded warehouses, licenses for which are granted upon consent of the Ministry of Finance. Only such buildings and rooms may be used as are recognized by the customs authorities to be suitable, and where the proper precautions are taken against smuggling. Where new buildings are projected, the plans should be submitted to the customs authorities and the requisite guards against smuggling be agreed upon in common. The storerooms for dutiable goods should be apart from those where other classes of goods are kept.

TARIFF AND OTHER CHARGES.

The general tariff for storage in the municipal warehouse of the city of Vienna is arranged according to the following classes:*

Class I, paying 3 kreutzers (1.2 cents) a week for each 100 kilograms (220 pounds), comprises albumen, amber, brooms, brushes, canned goods (packed), chemicals (inexplosive and incombustible), enamel ware in chests, feathers, glassware (unpacked), hardware in chests not otherwise specified, liquor packed in chests not otherwise specified, machinery (for which unloading and loading are charged according to the time and labor), meerschaum, mother-of-pearl, shellac, and varnish.

Class II, paying 2 kreutzers (0.8 cent) a week for each 100 kilograms, includes aniseed, cheese, cinnamon, clover seed, coffee, cut dyewood, dried blood, dried fruits (with the exception of prunes), drugs not otherwise specified, empty sacks, earthenware, fruits not otherwise specified, glass goods in chests, groceries and spices not otherwise specified, hides (raw, dried), hops, iron goods in chests not otherwise specified, leather, matting, metal ware in chests not otherwise specified, packed candles, poppy reed, paper, paprika, porcelain in chests, raisins, rubber, and seeds not otherwise specified.

Class III, paying 1 kreutzer (0.4 cent) a week for each 100 kilograms, embraces asphalt, axles, bacon, baled hay, baled straw, boiler iron, car wheels, cast-iron pipes, cements, chalk, common coloring earth, common woods, cotton, dried beets, dyewood in blocks, flax, glue, hemp, herrings, honey, lard, manure, metals (in bars, blocks, or sheets), mineral wax, oil in barrels, oil cake, paraffin, pasteboard, plaster of paris, potash, prunes, rice, salt, saltpeter, scythes, soda, starch, steel, steel rails, sugar (in forms, sacks, or barrels), sumac, sirups, talc, tanned hides, tanning materials not otherwise specified, trucks, vitriol, white lead, wool, and woven sea grass.

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*The prices are still quoted in the old Austrian currency of gulden (or florin) and kreutzer, and not in crown and heller, which are one-half, respectively, of a gulden or kreutzer, now almost generally introduced in the Monarchy.

Class IV, paying 0.5 kreutzer (0.2 cent) a week for each 100 kilograms, covers goods which may be stored out of doors on the warehouse grounds. The warehouse does not hold itself responsible for any damage to goods stored in the open air; and the unloading and reloading of such goods is allowed to be done by outside labor, at the wish of the depositor.

In the Vienna warehouse, the following articles may not be stored: Artificially greased wool from wool refuse, benzine, dynamite and all explosive chemicals, gunpowder, gun cotton, inflammable acids, naphtha, nitroglycerin, petroleum, petroleum ether, rosin, sulphur, tar, turpentine oils, and all spirits, without exception.

Among the various incidental charges may be mentioned the insurance fee for each 100 florins ($40) of the insured value, 4.5 kreutzers (1.8 cents) a month; the fee for unloading or loading of packed goods, 3 kreutzers (1.2 cents) for each 100 kilograms; for unloading or loading unpacked goods, 5 kreutzers (2 cents) for each 100 kilograms. Custom-house brokerage is reckoned at 25 kreutzers (10 cents) up to 100 kilograms, 45 kreutzers (18 cents) for quantities from 100 to 600 kilograms (220 to 1,320 pounds), and above 600 kilograms, 6 kreutzers (2.4 cents) for each 100 kilograms. For whole carloads of the same kind of goods, 4 florins ($1.60) is charged for each carload; for packing, in addition to the packing materials, for each small package, 20 kreutzers (8 cents); for larger packages, 25 cents. For additional labor in connection with loading or unloading, 25 kreutzers (10 cents) an hour is reckoned for each man—1 florin (40 cents) for half a day and 1.60 florins (64 cents) for a whole day. Thirty kreutzers (12 cents) is required for a certificate of deposit. For any payments for freight, or other cash disbursements, 5 per cent interest per annum must be paid. For receiving payments for goods or for business transactions in connection with goods stored, one-eighth of 1 per cent will be collected.

The warehouse management, when required, furnishes, without assuming any responsibility, as exact samples as possible of certain classes of goods, and charges, inclusive of delivery daily at noon at the fruit and grain exchange, 20 kreutzers (8 cents) for each letter sample or 30 kreutzers (12 cents) for samples in small packages, bottles, or tins. There is a special tariff for grain of all kinds. In sacks, the storage is reckoned at 0.6 kreutzer (0.25 cent) a week for each 100 kilograms; loose in bulk, 0.8 kreutzer (0.3 cent) for each 100 kilograms. The special rates for sugar of any sort in quantities of at least 5,000 kilograms (5 long tons) is scheduled at 1 kreutzer (0.4 cent) for each 100 kilograms. There are also special rates for spirits stored in iron reservoirs and reckoned according to the time of year in which the goods are entered for storage. The rate on wine in casks is calculated at 2 kreutzers (0.8 cent) for each 100 kilograms for the first two weeks, and for each following week at the rate of 1 kreutzer (0.4 cent).

NOTES.

Goods stored in bonded warehouses may be unpacked, repacked, divided, and marked over, weighed, inspected, and, if fluid, refilled or mixed—in short, manipulated in any manner needful for their preservation or preparation for sale, and not endangering customs claims. No goods may leave a bonded warehouse without a prescribed official permit.

The owners of bonded warehouses are responsible to the Government for the correct fulfillment of all regulations, and also of all imposed pecuniary obligations, not only to the limit of the security given, but with their entire property. The transgression of any of the regulations entails the prescribed legal penalty and may result in loss of license. Every public warehouse must publish a complete price list, with the maximum rates charged for storage and for attendant costs and fees, which must be affixed in the business rooms of the establishment. The owners of public warehouses are prohibited, on penalty of losing their license, from speculating in any manner upon the goods stored in their charge.

CARL BAILEY HURST,
Consul-General.

VIENNA, *July 3, 1902.*

REPORT FROM TRIESTE.

WAREHOUSE LEGISLATION.

The first Austrian law, or rather ministerial decree, authorizing the erection and regulating the administration of public warehouses appeared in 1866. Its object was "to secure to commerce every possible facility contemplated by the general tariff law, to aid the free circulation of merchandise, and to develop commercial credit." This decree was, with various amendments, in force until April 28, 1889, when it was repealed by the passage of a parliamentary act which brought the management of such warehouses under stricter governmental control, and at the same time provided for the issuance of negotiable warehouse receipts.

PURPOSES FOR WHICH WAREHOUSES MAY BE ESTABLISHED.

Under the last-mentioned act, public warehouses may be established for the following purposes:

1. To keep in custody in the "free zone territory" (Punto Franco) foreign merchandise subject to duty, but not yet entered, until such merchandise is entered, transported under bond to another customs district, or reexported.

2. To keep in custody in the free-zone territory goods of home production "under preservation of their nationality" until they are exported or returned to the customs territory.

3. To keep in custody merchandise subject to an octroi or city tax until such tax is paid or the goods are shipped out of the city.

4. To keep in custody in the interior of the country goods subject to customs duty or other imposts until such duty or impost is paid or the goods are reexported.

GOVERNMENT LICENSE.

No public warehouses can be opened without a license from the Minister of Commerce. Before such a license can be obtained, the statutes and regulations of the proposed establishment must be submitted to the Ministries of Commerce and Finance for examination and approval. Concessions may be granted to commercial corporations and municipalities, as well as to private individuals. The latter alone are required by law to file a bond with the Government.

THE STATUTES.

The statutes must contain the general terms and conditions upon which goods will be received for storage. They must further contain explicit information as to (*a*) the storage charges, changes, and publication thereof; (*b*) the guaranty given to the depositor; (*c*) the issuance of certificates of deposit; (*d*) the legal claim or lien which the warehouse has on the goods stored; (*e*) its right of sale; (*f*) the settlement of controversies by arbitration.

SPECIAL STATUTORY RESTRICTIONS.

Public warehouses are not permitted to engage, either on their own account or for others, in commercial transactions involving goods in their custody, or to make loans on such goods. In fact, their business is limited strictly to storing and allied transactions.

CLAIMS.

Claims for loss or damage which a superficial inspection at the time of delivery did not reveal are not valid, unless they are made as soon as such loss or damage is discovered and it can be shown that it occurred during the time of storage.

The law furthermore permits warehouses to insert in their regulations a notice to the public that they will not be responsible for any loss or damage for which a claim has not been presented within a certain period after the withdrawal of the stored goods. This period, however, must not be less than four weeks.

INSURANCE.

It is the duty of every warehouse to insure all goods in its keeping against loss by fire, and the insurance must cover the full value of the goods. If goods on which a certificate of deposit has been issued are destroyed by fire, the insurance money must be paid to the warehouse, which in turn is responsible to the legal owner of the goods.

RECEIPTS.

Parties depositing merchandise are entitled to a receipt or certificate of deposit. This receipt consists of two separable parts, viz:

1. A certificate of ownership.
2. A pawn certificate (here commonly called warrant).

This receipt, as well as either part of it, is negotiable. Each part must contain (*a*) the date of issue and the name and location of the warehouse; (*b*) the signature of its manager or responsible agent; (*c*) the number of the deposit book; (*d*) the name and address of the depositor; (*e*) a full description of the goods deposited; (*f*) the amount for which these goods are or will be insured and the name of the insuring company; (*g*) the period of deposit, if already determined; (*h*) a statement as to whether the goods are subject to customs duty, excise, or octroi tax.

LOANS AND ASSIGNMENTS.

Loans may be taken on the whole receipt, or certificate, or on either one of its parts. The custom in Trieste is to take loans on the whole receipt, the warrant being seldom, if ever, assigned separately.

When both parts of the receipt are assigned together, the indorsement of the certificate of ownership is efficacious for the whole receipt.

When money loaned on the whole receipt is not returned the day it falls due, the lender must give formal notice thereof to the owner of the goods, and if payment is then not made within thirty days, the former may take possession of the goods.

The holder of both parts of a receipt, proving himself to be the legal owner, may demand a new receipt in his name, and may then dispose of the goods as he chooses.

When a loan is taken on the warrant, apart from the certificate of ownership, the indorsement of the warrant must contain (*a*) the name and domicile of the indorsee; (*b*) the amount loaned and the rate of interest; (*c*) the date on which the loan falls due.

These data must also be entered on the deposit book, which the warehouse is by law required to keep. A defective first indorsement makes the loan null and void.

The above formalities need, however, not be observed on future indorsements; but such indorsements must be recorded in the warehouse deposit book, if indorsees desire it.

If the loan on the warrant is not paid the day it falls due, it must be protested in the same manner in which notes of exchange are protested, and if payment is then not made in due time, the holder of the warrant may have the goods sold, but the right of recourse is lost if they are not sold within thirty days after the warrant has been protested.

The assignment of the certificate of ownership to the holder of the warrant is the same as a legal transfer of the goods.

If the certificate of ownership is assigned without the warrant, the assignee's title becomes the same as was that of the assignor, and the rights of the warrant holder are in nowise affected by the transaction.

INSPECTION OF DEPOSITS.

The warehouse is obliged to permit the inspection of goods and to allow samples to be taken at any time by parties holding either part of the certificate.

WITHDRAWAL OF DEPOSITS.

Whenever the owner presents the entire certificate of deposit or its two parts and pays all storage dues and expenses, the goods must be delivered to him.

They must also be delivered to him, even though the warrant is not in his hands, if he deposits with the warehouse a sum sufficient to cover the amount of the loan and the interest up to the time the loan falls due. This may be done at any time before the period of deposit or that of loan has expired.

WAREHOUSE LIEN.

The warehouse has a lien on all goods in its custody for storage dues, as well as for all expenses incurred thereon, such as custom duties, insurance, transportation charges, etc.; and it may even borrow money on, and mortgage, the goods to the full amount of its claim thereon.

RIGHT OF SALE.

The warehouse has a right to sell the goods in its keeping whenever the stipulated term of deposit has expired; or, after one year, if they are deposited for an indefinite period; or at any time when the goods are in danger of perishing.

DISPOSAL OF PROCEEDS.

The proceeds of such sales must be applied to the payment of claims in the following order: (1) Custom and excise duty; (2) expenses of sale; (3) warehouse dues and expenses; (4) claim of the warrant holder.

Any balance left must be paid to the owner.

RIGHT OF RECOURSE.

If the warrant is paid in full, it must be surrendered; but if it is paid only in part, the amount paid must be noted thereon and the warrant returned. In such a case, the warrant holder has recourse and may protest against all parties liable for the full amount of his loss.

ATTACHMENTS.

Goods for which a receipt has been issued can not be attached or taken for security, but the negotiable receipt, if still in the hands of the debtor, may be attached instead. The warrant of a receipt so attached is no longer negotiable.

RECEIPTS ANNULLED.

When a receipt or an essential part thereof is lost, it becomes the duty of the warehouse, upon request of the loser, to give public notice of such loss and to declare the certificate canceled.

PUBLIC WAREHOUSES IN TRIESTE.

The first public warehouses in Trieste were erected in 1887, and were for several years managed jointly by the chamber of commerce and the city. Although the business of the new institution was carefully and economically conducted, it resulted year after year in a considerable deficit, and in 1894 the Government was prevailed upon to purchase the warehouses and to manage them on its own account. Many improvements have since been made. The warehouse finances are, however, not yet satisfactory. The annual balance sheets still show large deficits, which must be met by governmental appropriations.

FREDK. W. HOSSFELD,
Consul.

TRIESTE, *September 19, 1902.*

BOHEMIA.

The business of advancing cash, or loaning money on marketable merchandise, deposited in warehouses in Bohemia, is very extensive and is steadily increasing. The warehouses are authorized, according to the act of April 28, 1889, to issue warrants, or receipts, representing about two-thirds of the market value of merchandise deposited, but do not themselves advance cash upon the same, and before they are accepted by banks as collateral on loans these warrants are required to be indorsed by two individuals or firms of good financial standing, and the loans are made for a period not exceeding three months.

PUBLIC WAREHOUSES.

Public warehouses, in addition to paying a license tax, are compelled by the Government to deposit a bond, representing available Austro-Hungarian securities, as a guaranty for the faithful performance of their business under the laws of the country governing the same.

These warrants are only issued upon the deposit of certain specified articles, such as sugar, grain, wool, cotton, iron, alcohol, glass, beet root, wine, linseed, etc. Explosives or perishable goods are not accepted under any consideration.

Holders of warrants have the right to inspect the merchandise hypothecated and deposited, but there is no governmental supervision over the same.

PRIVATE WAREHOUSES.

There are also in this country many private warehouses, which are usually controlled by banks or financial institutions and are more liberal in their transactions, making loans and advancing cash on deposits of merchandise of the same character as that in public warehouses. Although their charges are higher for storing and moving than those of public warehouses, they are more popular and their business is increasing much more rapidly, as they require no security for the advance of cash other than the deposit of merchandise; they protect themselves in the usual way, however, against loss upon the deposit of merchandise liable to heavy fluctuations in value.

ETHELBERT WATTS,
Consul.

PRAGUE, *August 9, 1902.*

HUNGARY.

PUBLIC WAREHOUSES.

In Hungary, a public storage warehouse is understood to mean a concern engaged in the storage of wares, upon which it may legally issue warehouse receipts (warrants). The character of the public warehouse and the conditions of issuing the receipts are regulated by title 6 of the second part of the commercial law (Law XXXVII of 1875), according to which a public storage warehouse must prove an actual capital of at least 1,000,000 crowns (say, $200,000). Such concern may grant loans equal to two-thirds of the value of the wares received for storage and preservation. The law prescribes exactly how the receipt, which consists of two parts (goods label and pawn receipt), may be used for the grant of loans; but there are only a few such public warehouses in Hungary. Banks have had no trouble so far in the negotiation of these public-warehouse receipts, being well protected by the above-cited section of the commercial law.

PRIVATE WAREHOUSES.

There are, however, in Hungary some thirty private storehouses, with various amounts of capital behind them, a considerable number having been founded by the banks themselves. The receipts of these storehouses have not the legal value of notes, as have the receipts of public warehouses; but this does not prevent their using the receipts as collateral for loans, and the storing concerns or the banks connected with them grant loans up to 70 or 80 per cent of the value of the wares stored. As no abuses in this line have occurred hitherto, it is claimed, and no receipts have been presented to banks which were issued by warehouses without really representing stored goods—the value of which the banks were always able to determine—there has not yet been need for State or other Government supervision of private storehouses.

GRAIN ASSOCIATIONS.

A new feature in the public-warehouse institution in Hungary is that grain-selling associations have been formed, which take from the members, store, and finally sell the grain received, meanwhile granting loans on the stored grain. But inasmuch as these associations, like the private storehouses, can not issue negotiable receipts for the value of notes, and as the associations themselves grant the loans, no supervision of the same has yet been instituted.

All Hungarian storehouses are organized under constitutions with by-laws, copies of which can be had by applying to the companies themselves.

FRANK DYER CHESTER,
BUDAPEST, *August 16, 1902.* *Consul.*

BELGIUM.

GENERAL REPORT.

Negotiable warehouse certificates, as known in the United States, do not exist here as collateral for loans. Banks, however, advance money on all classes of marketable merchandise, of which they take possession, the place of storage being a matter of agreement between the parties. The bankers insist on the goods being stored in their names, and also upon the insurance policies being taken in their names, as the law of this country gives no special lien on goods as collateral when stored in the name of the debtor, the first creditor to sue having the privilege of seizure. The amount advanced varies from 60 to 80 per cent, according to the liability to fluctuation in price of the merchandise in question. When banks loan on goods to be delivered, the money is advanced on the bills of lading being duly indorsed to them.

Freight agents or shipping houses which enjoy the confidence of the financial market and have their own warehouses give their customers what is known as a warranty or certificate of storage, with which they may obtain an advance from the bank in whose name the goods are stored; and on presentation of the same, when duly indorsed by the firm issuing the warranty, they may withdraw all or a part of the goods.

The following is a translation of a warranty bond issued by one of the largest shipping houses of Antwerp:

> The undersigned ship brokers and forwarding agents hereby declare that they hold at the disposal of the bank of ———, or its order, the following goods stored in their warehouse ——— at Antwerp, situated ———, to wit:
>
> X Y Z, 150 bales raw American cotton, weighing ——— kilos. Imported from ———, per steamship ———. The insurance has been effected by ———. The storage charges are due from ———.
>
> Given at Antwerp this ——— day of ———, 19—.

Besides the private warehouses of well-known and reputable houses above referred to, the bonds of the "Entrepôts General" and the "Entrepôt St. Felix" (corporate companies) are accepted without hesitation by bankers.

GEO. F. LINCOLN,
Consul-General.

ANTWERP, *July 2, 1902.*

REPORT FROM BRUSSELS.

Belgian bankers readily make advances upon negotiable warehouse receipts issued for such goods as wool, sugar, grain, etc., varying from 70 to 80 per cent on the value of the goods stored. Said receipts are made out in the name of the banker or bankers advancing the loan, and are used to assist in drawing up warrants itemizing the goods, upon the back of which the owner of the goods writes a promise to pay in full the amount advanced at the expiration of a date agreed upon. These warrants are discountable at the National Bank the same as ordinary commercial drafts. A list of goods on which it discounts warrants, as well as the margin which must exist between the sum advanced and the value of the goods, is issued by the National Bank. The bank fixes at 75 per cent (provisionally) advances to be made on warrants covering the following goods:

Building wood.
Coffee.
Cotton, raw.
Copper.
Cast iron.
Dyes.
Flax.
Flour.
Gum.
Grains.
Hair, raw.
Hemp.
Indian corn.
Indigo.
Iron (raw and bars).
Ivory.
Jute.
Lead.
Nitrate of soda.
Rice.
Stearin.
Steel bars.
Sugar.
Tallow (grease).
Tea.
Tin.
Tobacco leaves.
Tow.
Wool, raw.
Zinc.

The discounts on warrants covering other merchandise must be made by special request.

GEO. W. ROOSEVELT,
Consul.

BRUSSELS, *July 31, 1902.*

REPORT FROM GHENT.

Goods, wares, and merchandise are received at six ports in this consular district for the payment of customs dues, but no system of supervision is maintained, either by the Government or private companies, for the storing of goods as collateral for loans. Merchandise deposited in the warehouses of both the General Government and those of the municipality is hypothecated as security for loans made by local banks, but this is by contract and arrangement between the bank and the party holding the warehouse receipt.

As appears from the translation of the receipt here following, the Government assumes no obligation or responsibility as to the value, damage, or loss of the merchandise:

RECEIPT.

CITY OF GHENT.

No. ——. Outer port.

Received from Mr. ——— ———, the sum of ———, for right to deposit goods under shed No. —— of ———, from ——— until ———.

——— ———,
Receiver.

GHENT, ———, *1902.*

The security of the merchandise deposited remains exclusively at the risk of the depositor. The city assumes no obligation therefor and declines all responsibility for theft, damage, or loss of merchandise.

CITY OF GHENT,
Communal Warehouse.

No. —— of the register of the certificates of deposits.

The receiver of the communal warehouse of the city of Ghent, undersigned, declares to have received in the said warehouse from Mr. ——— ———, the merchandise here below described, which he declares to have imported the ——— by ———, Captain ———, from ———, in the name and for the account of ———,

which shall be returned against the remittance of the present receipt duly signed for discharge and against payment of all warehouse charges or others which shall be due from the date of the receipt.

The bearer of the present certificate will be permitted on its production to take all measures authorized by the rules for sampling, safeguarding, inspection, and conservation of goods. On his part the receiver may take such measures as he may judge necessary in the interest of the preservation of the building or of the goods, or buildings in the neighborhood, the whole at the expense of the depositor, without any notice and without criticism under any pretext whatsoever.

The city of Ghent is not responsible for the preservation of the goods, which is at the risk of the depositor, either in case of fire or by force majeure.

The present document is delivered in single copy. It will be considered null and void if not renewed after one year. This time past, the city of Ghent may, if the state of the merchandise necessitates (this to be ascertained by an expert appointed by the president of the tribunal of commerce), sell at public auction the said merchandise to cover the expenses, and guard the surplus at the disposition of the party having right to same, without interest.

No.	Nature of the merchandise.	Marks.	No.	Weight declared by the warehouse keeper.

GHENT, ———, *1902.* ——— ———, *The Receiver of Warehouses.*

When the loan is agreed upon, these receipts are made out in the name of the bank making the loan and are delivered into the possession of the bank. Thereupon, the bank enters into a contract with the holder of the original warehouse receipts to loan him from 25 to 75 per cent of the declared value of the merchandise, at a certain per cent for interest plus a certain per cent for commission. To protect itself, the bank usually has the merchandise examined as to value, or a sworn statement issued as to its weight, besides having it insured against fire to its full declared value. If conditions under the contract are broken, the bank sells the merchandise, as in the case of a foreclosure of a mortgage, to reimburse itself for principal, interest, and expenses.

In other parts of Belgium, private companies have been organized to guarantee the existence and value of merchandise used as collateral for loans. Early in July, an effort is to be made to effect such an organization in Ghent.

FRANK R. MOWRER,
Consul.

GHENT, *June 28, 1902.*

DENMARK.

Only the warehouse receipts issued by the Copenhagen Free Harbor Company, Limited, or by officials of other approved warehouses in Copenhagen are accepted as security for loans. The certificates given to the bank by the warehousemen must stand in the name of the bank. Fire insurance on the goods must either be covered by the warehouse company or on a separate policy, which is deposited with the bank.

Rent and other expenses on the goods stored are to be paid by the borrower monthly, on demand by the warehouse company. If not paid, the loan is to be considered forfeited without notice. The bank has the right at any time to examine in order to find if the stored goods are sufficient for the amount of the loan.

In case of diminution in value of the goods, on account of falling prices or for any other reason, the bank has a right to demand payment of the loan or to demand additional security; and in case such demand is not met, to realize the value of the goods at the borrower's expense and according to the following rules, namely: If the loan is not paid after eight days' notice, given according to the letter of hypothecation, the bank is free to satisfy the claim by sale of the goods at public auction or through an authorized broker, on cash payment or on credit, as the bank may elect; and the borrower is pledged to pay to the bank that part of the loan which was not satisfied by the sale of the goods, after the deduction of the warehouse charges, insurance, etc.

The demand on the debtor shall be made by registered mail. Such demand shall be accepted as valid if the receipt book belonging to the bank shows that the registered letter was delivered on the said date to the post official for transmission to the said debtor or his attorney. If the debtor maintains that the registered letter did not contain the demand or notice of sale, the burden of proof is on the debtor.

It will be observed that the documents necessary to secure a loan are:

1. A note by the borrower to the bank for the amount loaned.
2. A letter of hypothecation of the goods as collateral security.
3. A certificate of the warehouseman that the goods described are in store and subject to the order of the bank.
4. A certificate of an appraiser (a merchant broker) that the goods exceed the value of the loan.
5. A policy of fire insurance.

There is no Government regulation of warehouses with reference to loans in this country, any more than there is of banks. There is a national bank—the only one which issues currency. All the other 200 banks are private enterprises, not subject to Government inspection or control. The directors publish the rules, which they themselves adopt. In the various financial crises of the last thirty years, only two of the more than 200 banks in Denmark have suspended payment, and that only for a short period. Confidence of the depositor in the bank and faith of the banker in the integrity of the borrower are the principles upon which business relies.

J. C. FREEMAN,
Consul.

COPENHAGEN, *July 31, 1902.*

FRANCE.

FRENCH LAW GOVERNING WAREHOUSES.

The following extracts from the laws of May 28, 1858, August 31, 1870, and decree of March 12, 1859, by which the present warehouse system was established, and by which it is regulated, have been received from Consul-General Gowdy, of Paris, and Consul Thackara, of Havre:

LAW OF MAY 28, 1858.

ARTICLE I. Warehouses (magasins généraux) created by virtue of the decree of March 21, 1848, and those which shall be established in the future, shall receive raw materials, merchandise, and manufactured products which merchants and manufacturers shall desire to store in them.

Warehouses are established upon being authorized by the Government, by and with the advice and consent of the chambers of commerce and the chambres consultatives des arts and manufactures, and are under Government surveillance.*

Receipts (récépissés) issued to owners of goods stored in warehouses must indicate the name, profession, and residence of said owners; also the nature of the merchandise, and all information necessary to establish the identity and value of the said merchandise.

ART. II. To each receipt is annexed a security certificate called a "warrant," which should contain the same data as the receipt.

ART. III Receipts and warrants can be transferred by indorsement, either separately or together.

ART. IV. The indorsement of a warrant separated from a receipt is a security to the lender to the extent of the merchandise covered by the warrant.

The indorsement of a receipt conveys to the grantee the right to dispose of the merchandise, provided that when the warrant is not transferred with the receipt, he will pay the amount guaranteed by the warrant, or will permit it to be paid out of the proceeds of the sale of the merchandise.

ART. V. The indorsement of a receipt and of a warrant transferred together or separately should be dated.

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*This paragraph has been abrogated by the law of August 31, 1870, a translation of which is given in another part of this report.

The indorsement of a warrant separated from a receipt should also indicate the total amount, capital and interest, of the loan guaranteed, the date of its expiration, and the name, profession, and residence of the creditor.

The first grantee of the warrant should have the indorsement, with all its declarations, registered immediately on the books of the warehouse company. The registration of the indorsement must be noted on the warrant.

Art. VI. The holder of a receipt separated from a warrant can pay the amount loaned on the warrant before maturity.

If the holder is not known, or, being known, is not in agreement with the debtor as to the conditions of payment before maturity, the total amount, including interest for the whole term of credit, may be paid to the warehouse authorities, who become responsible for the payment of the loan, and the merchandise can be liberated.

Art. VII. In default of payment at maturity, the holder of a warrant separated from a receipt eight days after protest, without any legal formality, can sell at public sale the merchandise involved in the manner and by the offices prescribed by the law of May 28, 1858.

In case the first indorser has satisfied the warrant, he can sell the merchandise involved eight days after maturity of the warrant without giving formal legal notice to the holder of the receipt.

Art. VIII. The creditor is paid from the proceeds of the sale directly, without legal formality, by privilege and in preference to all other creditors, without deduction, except of—

1. Internal-revenue taxes, octroi, and customs duties.

2. Expenses of sale, of storage, and those incurred for the preservation of the merchandise. If the holder of the receipt does not appear after the sale, the excess, after the holder of the warrant is paid, is turned over to the warehouse authorities, as in Article VI.

Art. IX. A holder of a warrant has no recourse against the borrower or the indorsers of the same, except after he has exercised his rights in the merchandise covered by the warrant, and then only when the proceeds of the sale are not sufficient to liquidate the amount of loan.

The time fixed by article 165 and following articles of the "code de commerce," in which the holder of a warrant can have recourse against the indorsers of the same, commences from the day when the sale of the merchandise is effected.

A holder of a warrant in all cases loses his right of recourse against the indorsers if he does not sell the merchandise in the month which follows the date of the protest.

Art. X. Holders of receipts and warrants, in case of damage by fire, etc., have the same rights and privileges in regard to the insurance indemnities as to the merchandise insured.

Art. XI. Public credit establishments can receive warrants as commercial paper with the dispensation of one of the signatures required by their statutes.

Art. XII. In case of loss of a warrant or of a receipt, the owner, after proving his right to the property and giving a bond, can demand and obtain, by order of a judge, a duplicate, in case of a receipt, and the payment of the loan guaranteed in case of a warrant.

DECREE OF MARCH 12, 1859, RELATIVE TO THE EXECUTION OF THE LAW OF MAY 28, 1858.

Articles relating to warehouses and to receipts and warrants.

Art. XIII. Receipts for merchandise, and the warrants attached thereto, when issued, are taken from a stub register.

Art. XV. At the request of a holder of a receipt and warrant, not separated, the merchandise stored may be divided into as many lots as the holder may desire, and the original receipt and warrant shall be replaced by as many receipts and warrants as there are lots.

ART. XVI. A grantee of a receipt and warrant can demand that the indorsement in his favor and his residence be transcribed on the stub register of the warehouse company from which the receipt and warrant were taken.

ART. XVII. At any time the warehouse authorities, upon the demand of a holder of a receipt or of a warrant, must liquidate the charges and expenses enumerated in Article VIII of the law of May 28, 1858, which take priority over the credit guaranteed by the warrant. The certificate of liquidation delivered by the warehouse authorities must indicate the numbers of the receipt and of the warrant to which it refers.

ART. XVIII. Upon the presentation of a protested warrant, the warehouse authorities must give to the broker designated by the holder of the warrant to sell the merchandise every facility for making such sale.

They will deliver the merchandise to the buyer of the same only after having examined the legal certificate of the sale, and (1) after having satisfied themselves that all duties, privileged expenses, and the total amount guaranteed by the warrant have been paid, and (2) that the excess due to the holder of the warrant in the case provided for in the last paragraph of Article VIII has also been paid.

ART. XIX. Besides the usual commercial books and the stub register for receipts and warrants, the warehouse authorities must also keep a stub book, in which are entered all the payments made by virtue of Articles VI and VIII of the law.

All of these books are numbered, and the first and last pages certified by the proper officers of the court, as prescribed by Article XI of the code de commerce.

LAW OF AUGUST 31, 1870.

ARTICLE I. Warehouses authorized by the law of May 28, 1858, and the decree of March 12, 1859, can be established by any person or by any commercial, manufacturing, or banking company when authorized in a prefectoral decree which is issued by and with the advice of a chamber of commerce; in default of which, by and with the advice of the chambre consultative; and in default of one or the other, by and with the advice of the tribunal de commerce. The sanction should be given within eight days after the request is made.

ART. II. The proprietor of a warehouse, by the terms of the prefectoral decree, shall enter a bond ranging from 20,000 francs ($3,860) to 100,000 francs ($19,300).

The whole bond, or a part, may be either in money, in Government bonds, in bonds listed on the bourse, or in a first mortgage on the buildings for double the amount of the bond. The value of the buildings will be estimated by the recorder of deeds (directeur de l'enregistrement et des domaines) upon the basis established for the collection of inheritance taxes.

ART. III. Proprietors of warehouses can loan money upon the security of merchandise stored in their warehouses, or can negotiate the warrants which the merchandise represents.

ART. IV. Warehouses already existing may enjoy the benefits of the present law in conforming, if they have not already done so, to the prescription of the law.

ART. V. Are abrogated the second paragraphs of Article I of the law of May 28, 1858, and all other provisions of former laws and decrees which are contrary to the present law.

REPORT FROM BORDEAUX.

The public-warehouse system of France consists of two classes of entrepôts, or warehouses, to wit:

1. Entrepôts, or warehouses, operated and controlled solely by public officials and employees in the pay of the Government. These are of several kinds; some under control of the officers of customs (douanes), others under direction of the officers of the excise or internal revenue (regie). The law in regard to the pledge of goods as collateral by the owner is substantially the same in all of them.

2. Entrepôts, or bonded warehouses, kept, controlled, and operated by private persons under license from the Government and under inspection and control of Government officials.

Goods stored in entrepôts of either class may be used by the owner as collateral for loans, subject only to the following limitations:

1. No owner or part owner of the entrepôt is allowed to lend money on goods in any warehouse in which he is interested.

2. A part owner of goods in an entrepôt can not pledge his interest as collateral unless the joint owner also engages in the pledge.

3. The consignee of imported goods not wholly paid for can not pledge them as collateral without the written consent of the consignor.

METHOD OF OBTAINING LOANS.

The process of pledging goods in bond as collateral in France and their release from such obligations is very simple.

To obtain a loan on merchandise in a public or private warehouse, where it is held as security for a public tax of any sort, the owner must execute what is termed a "nantissement," or declaration of all the facts of actual ownership and the further facts attending the proposed loan, which instrument must be served on the manager, if it is a warehouse operated by private parties, or on the "directeur," if it is in control of Government officials, by a "huissier," who prepares a procès verbal attesting the service of the declaration on the manager or director of the warehouse. A copy of this procès verbal must be filed and recorded at the public registry in the city or arrondissement where the transaction takes place.

The manager or official director of the warehouse can only deliver the goods, or any part of them, after service of the nantissement on a written order of the lender, which must also be served by a huissier and must also be registered at the public registry. This order is called a "main levée," being the release of a legal right. Such order can be refused only when the storage fees or the tax for which the goods are held are unpaid. The main levée may be for the whole or a part of the goods covered by the declaration. When the sum of the main levées equals the amount of the declaration, the filing of the last one by a huissier in the public registry acts, without further proceedings, as a release of the declaration or pledge. As the main levée can not be registered until it has been served on the warehouseman, all parties—the borrower, the lender, and the warehouseman—have due notice and no fraud is possible.

FRENCH VS. OTHER SYSTEMS.

The simple and beneficent operation of this system in France is, in my opinion, due to two things:

1. Because there is not, and never can be, any conflict between two systems. There is no equivalent of our State and national jurisdictions. Everything is under one system of government. There is but one source of power. The Departments are simply parts of the whole, and there can, in no case, be any "conflict of authority."
2. Because there is no judicial tribunal which has jurisdiction to review the action of an executive officer. There is, in all cases, an appeal to the head of the Department to which an official belongs, but no court can pass upon the questions involved or impugn the correctness of his action.

The difficulties that lie in the way of the adoption of any method of using imported goods as a security for loans in connection with our warehouse system seems to lie in the limitations imposed on Executive authority by the Constitution and the lack of federal jurisdiction of property rights in the several States. It seems clear that no such system could be established by Executive order, and it is very doubtful if Congress has the power to do so under any clause of the Constitution. Besides this, it should not be forgotten that many States have adopted in substance the English factor's act, which establishes an irrebuttable presumption of ownership in favor of any purchaser from a person having goods in possession or to whom they are shipped, whether as agent or purchaser. Conflict with such State laws would be inevitable in case of any attempt to establish a national system for the use of goods in bonded warehouses as security for loans in any other manner than by the assignment of warehouse receipts.

There is no nation which has as much need of such a system as the United States; yet it must be evident to any legal mind that the authority to establish one in which the warehouseman is an essential figure in the security and collection of loans on deposit in warehouses in different States is a matter of very doubtful power—as doubtful perhaps as would be the attempt to establish pawnshops in the different States by Congressional action.

ALBION W. TOURGÉE,
Consul.

BORDEAUX, *August 7, 1902.*

REPORT FROM CALAIS.

In France, bonded warehouses are authorized and regulated by law. Public chambers of commerce and private proprietors of bonded warehouses are governed by the same regulations, except, however, that chambers of commerce do not give to the French Government the guaranty required of private bonded warehousemen, amounting to from $4,000 to $20,000. The French Government, however, has no other supervision than requiring the above obligation and giving the authorization. Both, upon the deposit of the merchandise, give to the owner a receipt and a warrant, and surrender the merchandise only upon the return of the receipt and warrant, or the payment of the amount of the sum borrowed. Chambers of commerce do not make loans, but hold the goods in trust as a guaranty for money borrowed on the warrant issued, which is in every sense negotiable. When negotiating the warrant, its first proprietor has to notify the chamber of commerce of this first negotiation, stating the quantity of goods engaged and the sum of money borrowed upon it. Private bonded warehouses loan on the warrant issued by them such sum as the depositor desires, specifying in the warrant the lots of merchandise held by them as security. Should the merchant desire an additional loan, another warrant may be issued on another specified lot of the merchandise deposited. The warrants issued by bonded warehousemen are negotiable, as are those issued by the chambers of commerce.

All warrants are issued for a time stated. In default of payment at maturity, the holder has the right to seize the goods and sell them and thus realize the amount due.

For the above information I am indebted to Mr. Néel, secretary of the Chamber of Commerce of Calais.

In this city, there are no bonded warehouses, the only depots for the storage of merchandise being those of the chamber of commerce. The following is a copy of its regulations:

> The chamber of commerce shall deliver to every depositor, on demand, a receipt and a warrant, both transferable by way of indorsement, in the form and under the conditions specified in the law of the 28th of May, 1858, and decree of the 12th of March, 1859.
>
> Each lot, being the object of a receipt or warrant, shall comprise only packages deposited together at the same place. But such lot shall be divided into as many lots as the depositor may desire, and, in such case, separate receipts and warrants shall be delivered according to the quantity of distinct lots.

J. B. MILNER,
Consul.

CALAIS, *July 3, 1902.*

REPORT FROM HAVRE.

The methods in use in the city of Havre by which merchants and others can negotiate documents representing the value of goods stored, issued by the various warehouse companies, are simple and effective.

I have been informed that not a single case of fraud in the negotiation of warehouse receipts and warrants has been known in Havre since the warehouse system was established, some fifty years ago.

To a merchant wishing merely to store his merchandise in a warehouse without using it as collateral for a loan, there is issued an entry certificate (certificat d'entrée), which indicates the number and date of entry of the merchandise, the name of the owner, if imported, the name of the vessel in which the goods were brought to Havre, the marks, the number and kind of packages, the nature of the merchandise, the recognized weight, and the place where the merchandise is stored in the warehouse.

Whether the entry certificate is surrendered or not, the merchandise can not be taken from the warehouse without a discharge certificate (bulletin de décharge) issued by the warehouse company.

If, however, the owner of the merchandise desires to borrow money on his goods, he makes a written request of the president of the warehouse company for a receipt warrant (récépissé warrant).

RECEIPT WARRANTS.

There is no special form required for the request; but in order that the owner may not omit any of the information required to be inserted in the request, the warehouse companies have adopted a printed form which is supplied gratuitously. A translation of the form in general use is as follows:

REQUEST FOR RECEIPT WARRANT.

Number of the company's entry register.
Merchandise: Foreign, domestic.
Merchandise upon which duties have been paid.
No. —— customs.
No. —— receipt warrant.

———, (name) the undersigned merchant, living at Havre (give address), requests, conformably to the law of May 28, 1858, and to the decree of March 12, 1859, a receipt warrant for the merchandise of which the marks, numbers, and description follow, which, being imported into Havre by the ship (name of vessel), the (give date of arrival of vessel), captain (name of captain), coming from (name of country), were stored in the warehouse (give date), under the number (give number of warehouse-entry certificate), in the warehouse No. —— of the (name of warehouse company) as follows:

(Give description of merchandise.)

These goods were estimated by Mr. (give name), broker, as worth (give estimated value), deduction having been made for customs duties, internal-revenue taxes, octroi, storage charges, discounts, and the charges approved by the Chamber of Commerce of Havre (bonifications d'usage).

—— ——.

HAVRE, ——, *190*—. (Signature of merchant.)

The warrant is issued joined to the receipt, the two bearing the same number, and are taken from a stub register, numbered and certified according to law. If the owner of the merchandise wishes to divide it into several lots, and to have receipt warrants for each lot, he should, in his request, specify the lots into which he wishes his merchandise divided. For instance, if he has 1,000 bags of coffee, and wishes three receipt warrants, he should enter in his request:

	Pounds.
500 bags of coffee, weighing gross	6,000
250 bags of coffee, weighing gross	3,000
250 bags of coffee, weighing gross	3,000
Total	12,000

If, after a receipt warrant has been issued for merchandise, the owner wishes to have several receipt warrants for the same merchandise, his course of procedure would be as above, and after having surrendered the original receipt warrant, the president of the warehouse company would issue new receipt warrants covering the lots into which the merchandise was divided.

If the owner of the goods stored wishes to borrow money on them, he presents the receipt warrants to any of the banks of Havre, accompanied by a certificate of value of the goods, called invoice of receipt warrant, signed either by two sworn brokers or two responsible merchants, who are acceptable to the bank. These values are determined by the experts either from samples of the merchandise or from actual view of the merchandise itself. A translation of the invoice is as follows:

INVOICE OF RECEIPT AND WARRANT.

No. —— entry.
No. —— customs.
No. —— receipt warrant.
Marks and quantity of merchandise.

The undersigned having been asked to estimate the value of the merchandise designated in the margin, and which has been declared to them as being stored in (give name of warehouse) of Havre by (give name of owner of merchandise) under the entry No. ——, certify that after an examination of (state whether samples or the merchandise itself) they estimate the said merchandise to be worth this day the price of (give value) per (number of kilograms).

(The brokers should state whether the price is for the merchandise duty paid, or in the bonded warehouse, or if the merchandise is exempt from duty.)

HAVRE (give date). (Signature) ———— ————.

Number and marks of packages.	Gross weight.	Tare.	Net weight.	Estimated price.	Value, gross.	Discount.	Value, net.	Amount advanced by bank.

After having come to an agreement with the bank as to the rate of interest, the time for which the money is borrowed, and the amount to be advanced on the merchandise, the borrower indorses the warrant to the order of the bank, indicating in the indorsement the amount borrowed, the date when due, the name, profession, and residence of the creditor. The warrant and receipt should be sent to the warehouse company, to have the indorsement registered on its books.

The president of the warehouse company, after having registered the indorsement of the warrant and noted the registration on the warrant itself, should also note on the receipt the necessary information to indicate that money has been borrowed on the warrant, so that in case of the sale of the merchandise the buyer should know that the goods have been used as collateral for a loan.

The warrant, indorsed and attested as above, in the hands of the lender is a complete security for the amount loaned. The only claims having precedence are those for the customs duties, internal-revenue taxes, octroi, and warehouse charges.

In almost every case, money is loaned on warrants for three months, at the prevailing rate of interest of the Bank of France. Since May 26, 1900, this rate has been 3 per cent. If the money loaned on the warrant is paid before the time of the loan has expired, a discount for the remaining days is allowed.

On coffee and cotton, the borrower has no trouble in securing 80 per cent of the value of his property, except when, owing to an abnormal condition of the markets, the prices are unusually high. On pepper, wool, and indigo, the advances are usually 75 per cent. As to other merchandise, not usually sold on the bourse, the advances are seldom less than 50 per cent.

If, at the expiration of the period for which the money was borrowed, the debtor wishes to renew the loan, he makes a request of the president of the warehouse company, on the printed forms supplied by the company, in the same manner as in asking for the original receipt warrant, giving the number of the latter. The president of the company issues a new warrant receipt and sends it, without being signed by him, to the holder of the original warrant. The debtor and creditor come to an agreement as to the amount loaned, time, rate of interest, etc.; then the receipt warrant is properly indorsed and returned to the warehouse company, when the president completes and signs the receipt warrant and delivers it in exchange for the original receipt warrant, which he immediately annuls in the warehouse register, noting on the stub of the original receipt warrant the date on which the latter was returned.

As mentioned before, loans are made on warrants for three months, but there is generally very little difficulty in having them renewed for periods of three months. If, at the expiration of the time for which the money was borrowed, it is not paid, the holder of the warrant should protest the latter on the day of the expiration, or the next day if the former should be Sunday or a holiday. Eight days after the protest, the holder of the warrant can proceed to sell the merchandise at public sale, according to the provisions of the law on public sales, without any further legal formalities.

The ordinary form of a receipt warrant is as follows:

Entry No. ——. Where stored ——. No. ——.

(Name of warehouse company.) Sanctioned by the Government.

RECEIPT TO ORDER.

There has been stored, under the entry number above noted, by Mr. ———, living at No. ——— street, the merchandise mentioned below, coming from ———, subject to customs duties, octroi, warehouse charges, and expenses, enumerated in article 8 of the law of May 28, 1858. The storage commenced since (give date).

Marks and number of packages.	Number of packages, and nature and weight of merchandise (all in letters).

HAVRE, the (date).

Signed by President of the Warehouse Company.

[Indorsement.]

Receipt No. ——. The warrant corresponding to this receipt has been transferred to Mr. ———, living at (place of residence), as guaranty for the sum of ———, payable the (date).

Signed by President of the Warehouse Company.

Entry No. ——. Where stored ——. No. ——.

(Name of warehouse company). Sanctioned by the Government.

WARRANT TO ORDER.

There has been stored under the entry number above noted, by Mr. ———, living at No. ——— street, the merchandise mentioned below, coming from ———, subject to customs duties, octroi, warehouse charges, and expenses, enumerated in article 8 of the law of May 28, 1858. The storage commenced since (give date).

Marks and number of packages.	Number of packages, and nature and weight of merchandise (all in letters).

HAVRE, the (date).

Signed by President of the Warehouse Company.

Warrant No. ——. Warrant negotiated for (give amount). Exportation (give date).

[First indorsement of warrant.]

Good for the transfer of the present warrant to the order of Mr. (name), (profession), living at (place of residence), to guarantee the sum of (give amount), payable (give date), at his residence (give place of residence).

[STAMP.] Signature of the Borrower.
HAVRE, the (date).

The above indorsement has been transcribed upon the warehouse register, stub (give number), volume (give number), the (give date).

Signed by President of the Warehouse Company.

The Bank of France, the State bank of the French Republic, requires two signatures on all warrants presented for negotiation; but other banks, if the borrower is considered responsible by them, demand only one signature—that of the debtor.

REGULATIONS FOR LOANS.

All banks, before loaning money on warehouse warrants, require a certificate to be filed, stating the amount of insurance on the merchandise for which the warrants were issued, which, in all cases, must fully cover the value of the goods.

The owner of merchandise for which a receipt warrant has been issued, and upon which he has borrowed money, can sell his merchandise. A purchaser being found for the goods, the receipt will serve as an instrument of sale, and an indorsement on it conferring on the purchaser the right to dispose of the merchandise transfers to the latter the ownership of the goods. Money having been borrowed on the merchandise, delivery can not be made until the amount borrowed has been paid to the holder of the warrant, or security has been entered with the warehouse authorities covering the amount of the loan. The warehouse authorities are then responsible for the payment of the loan at maturity.

If the warehouse authorities permit the sale of warranted merchandise in their keeping, at the request of the holder of the receipt issued for the same, without having the warrant duly satisfied and returned to them, or without receiving security from the holder of the receipt that the money loaned on the warrant will be paid at maturity, they are liable to the holder of the warrant for the difference in case the proceeds of the sale of the merchandise do not cover the amount loaned. The indorsement of the receipt warrant to the order of the same person confers on the latter the absolute right of possession of the merchandise. He can take delivery of the goods at his pleasure, provided he pays all warehouse charges, customs duties (if the goods are dutiable), octroi, etc.

When a receipt warrant has been issued by a warehouse company, the French courts have decided that the merchandise involved can be levied upon by the general creditors of the holder of the receipt warrant, even if the latter be a third party to whom the receipt warrant was transferred by indorsement, when the indorsement is not registered on the books of the warehouse company. If, however, the warrant has been indorsed in favor of a third party, and the indorsement has been duly transcribed on the register of the warehouse company, the goods can not be levied upon by the general creditors of the original holder of the receipt warrant, and they can only be withdrawn from the warehouse or sold by the consent of the third party interested.

A warehouse company is responsible for the number of packages, the weight, and the condition of the goods consigned to its care, except ordinary wastes and losses, from unforeseen causes beyond its control (force majeure).

The holders of receipt warrants can, at any time, assure themselves of the existence of the merchandise which is their property, or which the warehouse company is holding to guarantee their rights.

WAREHOUSES IN HAVRE.

In general terms, the above is the system of warehousing goods which is in operation in Havre. The principal warehouses are the Compagnie des Docks-Entrepôts, Compagnie Havraise de Magasins Publics et de Magasins Généraux, Docks du Pont Rouge, Compagnie des Entrepôts et Magasins Généraux de Paris, Docks du Canal de Tancarville, and Magasins Briquet.

In France, there are two kinds of warehouses which are under the surveillance of the customs authorities:

(1) Private warehouses (entrepôts fictifs), belonging to merchants or manufacturers, in which may be stored French colonial products, the duties on which have been lowered by act of Parliament, and certain merchandise specially mentioned in the customs laws. The owners of the warehouses are under bond to produce the merchandise upon the demand of the customs authorities, to reexport it in the time fixed by the law (one year) or to pay the duties if the merchandise enters into consumption before the time has expired. The owners of such warehouses are not allowed to do a general warehouse business, but merchandise permitted by law to be stored in

a private bonded warehouse (entrepôt fictif) may be received in the warehouses of the regular companies.

(2) Bonded Government warehouses (entrepôt réels) in which is stored foreign merchandise destined either to be reexported without payment of duty or to be delivered to consumption in the future. The Compagnie des Docks-Entrepôts, which is the largest warehouse company in Havre, is the lessee of the Havre bonded Government warehouses. The latter are under the double surveillance of the customs authorities (who hold the merchandise as a guaranty that the customs duties will be paid if it enters into consumption, or that the goods will be reexported within the time allowed by law) and of the warehouse company.

In the following table are shown the stocks on hand in the different Havre warehouses on June 30, 1902:

Stocks on hand in Havre warehouses, June 30, 1902.

Merchandise.	Docks-Entrepôts.		Cie Havraise de Magasins Publics.	Magasins Généraux de Paris.	Pont Rouge.	Magasins Briquet.	Docks du Canal de Tancarville.	Total.
	Bonded warehouse.	Free warehouse.						
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
Coffee	183,531	1						183,532
Pepper	3,896							3,896
Cocoa	9,874							9,874
Cotton		141	19,577	189	3,405	538	5,003	28,853
Indigo		2	282		126			410
Sugar	7,083		8					7,091
Wool		148	1,270		6,385			7,803
Copper	4		1,226	1,187				2,417
Rubber					180			180
Flour	1	51		2,526			1,550	4,128
Cereals and oil seeds	11	7	47	9,481	115		6,114	15,775
Rum	4,214							4,214
Various	4,039	(*)	(*)	(*)	(*)	(*)	(*)	4,039
Total	212,653							272,212

* 29,406 tons of various merchandise stored in other than bonded warehouses.

The warehouse system of Havre has been fertile in its results. There may be defects in it, but it is the general consensus of opinion among the bankers, merchants, and brokers that the system is a good one and has been instrumental in making Havre one of the most important commercial ports of Europe.

A. M. THACKARA,
Consul.

HAVRE, *August 12, 1902.*

REPORT FROM LYONS.

The business of warehousing goods and loaning money on goods stored as collateral security has been conducted in this city by one or more concerns during the last forty years, and has been found very useful as an accommodation to business men in providing a safe place to store goods temporarily, as well as a means of keeping the money value of their goods in circulation in business.

SILK WAREHOUSE.

Warehouses in France are called magasins généraux. One of them in this city occupies itself solely with the silk business, which is the most important interest in Lyons. It loans money on raw and manufactured silk and upon dechets de soie. It has a branch in Marseilles, and it also has a place which answers all the purposes of a custom-house. In the latter establishment, French dealers in raw silk store their merchandise as it arrives in the country until they determine whether to sell it in France or to export it to some other market. This warehouse is therefore a sort of a free port, in which goods can remain temporarily without payment of duty and at the same time serve as collateral security for a loan, which may be contracted in any bank in Lyons. The company never loans more than 80 per cent of the estimated value of the collateral security, the valuation being made by a sworn expert.

The company receives 4 and 5 per cent interest and the money loaned is paid at once to the borrower, or he can draw upon the warehouse company at three months or receive a warrant upon which he can always borrow money at a bank, perhaps at lower interest than is asked by the warehouse company. Money was loaned upon the following number of bales for the years mentioned:

	Bales.
1898	18,550
1899	30,450
1900	23,500
1901	31,000

The price for storing depends upon the quantity of silk. It is never less than 10 centimes (2 cents) per bale for two weeks.

For 1,000 francs' ($193) worth of silk, the storage fee for two weeks is one-fortieth of 1 per cent; for 2,500 francs' ($482) worth of silk, the storage fee for two weeks is calculated to be 10 cents.

The business of the three storage houses in Lyons amounts to a large sum, and the stock in each of them is considered gilt edged. The banks readily discount the warrants of all the warehouse companies.

VAISE WAREHOUSES.

Les Magasins Généraux de Vaise are situated on the shores of the Saône, near the city.

All the railroads entering Lyons have tracks running near the warehouses, and a large basin permits all the steamers that ply on the rivers Saône and Rhone to moor near the docks within a few feet of the warehouses. This company was established under an ordinance of King Charles X, in the year 1828. The grant at that time accorded the right to the petitioners to build a toll bridge over the Saône, and to dig and wall in a basin where boats could land. In 1860, Napoleon III, in consideration of the request made by the company and the indorsements attached to it from the senator from the Rhone, the Chamber of Commerce of Lyons, the Tribunal of Commerce of Lyons, and the petitions of a number of other dignitaries, permitted the company to build its present large warehouses and to receive and sell at auction all kinds of goods except silk.

Since 1860, the business of this concern has constantly increased. It has several thousand feet of warehouse room, which is always filled, and the tracks and basin near by are always a scene of activity in unloading and loading of cars and boats. In the year 1901, this company issued 201 warrants, upon which was borrowed 2,229,385 francs ($430,000, in round numbers). In the warehouses of the company are apartments for grain, flour, coal, wool, all kinds of fruits, vegetables, and open sheds for such commodities as are not of a perishable character or easily damaged by bad weather.

During the last thirty-three years of its work, it has received 257,800 tons of different kinds of merchandise, upon which it has given warrants, most of which have been used as collateral security for loans in the banks of Lyons. The company offers to take charge of all merchandise destined to Lyons, to pay the duty upon it, and to reexport it and collect the duty that may have been paid on its temporary admission. A merchant or manufacturer in any part of the world can send his goods direct to the Magasins Généraux de Vaise, Lyons, France, and they will be held there or exhibited to possible purchasers or sent on to any other destination desired. Dutiable goods are received in the warehouse without payment of duty until their final destination is known, and then no duty is paid in case the goods are exported to another country. While thus stored, the goods may always be security for a warrant, upon which money may be borrowed at any bank in Lyons. Among the advantages derived from the operations of this company, it may be observed that a merchant or manufacturer can store his goods while prices are low and wait for a rise before selling them; or he can take advantage of a fall in the price of raw material and lay in a large stock, which he will have no trouble in storing and which he can pay for in part with money borrowed upon a warehouse warrant. The company can handle goods more cheaply than any private business concern, and the purchaser, as a rule, has no care or anxiety about their arrival.

The practical effect of these warehouses in regard to goods which are received on temporary admission, to be exported to some other country, is to make Lyons a free port, as well as to furnish the most useful facilities for the merchants and manufacturers of this city. Practically all the stock of the company which stores silk is owned by manufacturers of and dealers in that article. The stock in the great Vaise warehouse is all owned by the business men of Lyons. The government, local or national, is concerned in these enterprises only in having granted permission to build the docks and warehouses, dredge the basin, and carry on the business.

LYON-GUILLOTIÈRE WAREHOUSE.

The Magasins Généraux de Lyon-Guillotière cover 15 acres and are principally devoted to the storing of grain and vegetables. They have been in operation since 1891 and have a capital of 750,000 francs ($145,000). Their buildings are situated on the line of the great Paris, Lyons, and Mediterranean Railroad, the tracks of the same running into their yards. I notice among their regulations that all merchandise received is numbered and none of it ever bears the name of an owner; that the company charges for the storing according to the weight when received, and allows no rebate for the difference that may exist at the time the goods are withdrawn; that the prices are so much per 1,000 francs' ($193) value, or for 100 kilograms (220 pounds) without fraction, for one month of thirty days. The goods are insured by the mere entry into the warehouse by a "floating policy," and each customer is expected to state the value of his goods when they are received. If he fails to do this, they will be valued according to the ruling prices and so calculated in the insurance policy. To cover the insurance, a sum of 6 cents per value of 1,000 francs ($193) is assessed upon the receipt of the goods. The company is responsible for any damages that may accrue to the merchandise stored in its warehouse, except in cases of some great accident or unpreventable occurrence and for damages caused by rats, or by a decline in value by natural shrinkage or something inseparable from the character of the article stored. Upon each warrant receipt, the depositor pays a sum of 30 cents, and the warrant is at once negotiable at any bank in Lyons. The business last year was very poor in all the warehouses, and the Magasins Généraux de Lyon-Guillotière issued only thirty-five warrants, upon which were borrowed a total of 361,400 francs (about $69,700). The outlook for the present year is much better.

The rates for storage are, per 100 kilograms (220 pounds), 2, 3, and 4 cents per month, according to the bulk or value of the article.

REGULATIONS.

No goods will be received from a cart unless they are accompanied by a statement signed by their owner, giving his address in full, the value and character of the goods, their weight, the number of parcels, bags, boxes, or barrels. The company receives no carload of less than 5,000 kilograms (11,000 pounds). Deposits weighing less than that must be brought to the warehouses in carts, which the company does for 4 cents per 100 kilograms (220 pounds). The company advances payment for carting, but if such advances are not promptly paid the company charges interest at the rate of 6 per cent per annum. The company declines all responsibility for any losses or damages of which the railroad company has not been notified and which it has not accepted as just.

As the company is only an intermediary agent between the railroad and the final assignee of the goods, the company insists that the bill of lading, containing a complete statement of all the goods, shall be made out in the presence of its agent, an officer of the railroad, and the owner or assignee, and its correctness certified to.

The rent paid for the railroad cars of the Paris, Lyons, and Mediterranean Railroad Company is 3.2 cents for six hours. At the expiration of that time, if the cars remain longer, the rent is 2.4 cents per ton for six hours or a fraction thereof.

LOANS ON FARM PRODUCTS.

There is another establishment in this part of France which loans money to farmers on their products, but it has no warehouse. It is called the Bank of the Agricultural Syndicate, or the Farmers' Alliance. The Government advanced 40,000,000 francs ($8,000,000, in round numbers) as a nest egg for this bank. The money was idle in the Bank of France, having been placed there by the Government. It consisted of sums that the Government had received from various sources, a part of it being unclaimed bank deposits, bequests which had never been claimed by heirs, or gifts which had never reached the parties or were never employed for the purposes for which they were destined, and which escheated to the Government. As there was no fund to which this money could properly be credited, the Government deposited it in the Bank of France and finally placed 40,000,000 francs of it to the credit of the agricultural societies of

France, as a fund for the organization of farmers' banks. The condition upon which this money can be used for the capital of a bank is that the farmers will first raise 50 per cent of the proposed capitalization. These banks now exist in nearly every agricultural region in France, and new ones are frequently being started. During the last year, the sums loaned to farmers on their products aggregated $971,533.50, at 3½ per cent interest.

The farmer is permitted to borrow 60 per cent of the value of the wine he may have in his cellar or the grain in his barn, as seen and certified to by an officer of the bank. He is permitted to hold the goods as long as he can pay the interest. This is a very important matter in the case of some kinds of wine, which improve with time. Instances are cited where a farmer borrowed money on his Beaujolais wine, which was worth only 30 francs ($5.79) per barrel, but which he sold a year later for 60 francs ($11.58), receiving just double what he would have been compelled to accept when his wine was made. The operation of these farmers' banks has caused considerable dismay among the large wine merchants, who were in the habit of buying large quantities of new wine and holding it for the improvement that time generally works upon certain brands. But there is only a limited number of producers who can benefit by this operation, as there are but a few brands of wine which improve with time. The farmer who attempts to hold his corn or wheat or wool on borrowed money must take the same chances that the man takes who buys on margins, and will often come out of the transaction in worse condition than if he had sold at ruling prices when his product was ready for market.

JOHN C. COVERT,
Consul.

LYONS, *July 3, 1902.*

REPORT FROM MARSEILLES.

Provision is made in French law for the creation by private capital of "general warehouses," the receipts of which are issued against deposited merchandise and accepted in financial circles as conclusive evidence of the material facts set forth. The documents thus issued are denominated by law as "commercial effects" along with checks, drafts, and notes, and are transferable by indorsement like ordinary business paper. The good faith of the receiving warehouse is vouched for by the local chamber of commerce, without whose approval the general warehouse can not exist, and as the chamber of commerce is an elective body, chosen by the whole commercial community, the pledge is guaranteed, in a moral sense, by the public at large. This democracy in business affairs and theoretical freedom from restraints imposed by private organizations operating under the name of "boards of trade," or similar titles, is an interesting feature of French methods which I shall take up later on.

WAREHOUSE BONDS AND REGULATIONS.

Before engaging in business, the general warehouse must "secure its circulation," as we should say of a national bank, by depositing with the State bonds or other representatives of capital, taken from the list of officially recognized securities, equal to from $4,000 to $20,000. The amount is fixed by the departmental prefect, acting under advice from the chamber of commerce, which must also "authorize" the creation of the new institution. These formalities accomplished, the warehouse may loan money upon the merchandise deposited, although, as a rule, financial operations are left to the regular money lenders. To the depositor is given safe storage facilities upon easy terms and without expenditure of capital, and either a simple nontransferable receipt or, as is more usual, a warrant and receipt annexed thereto. These documents may be indorsed separately or together. The indorsement of the warrant alone guarantees that the merchandise will remain undisturbed until the consideration is satisfied, and the warehouse itself is responsible to the holder of the warrant for the presence of the goods. The indorsement of the receipt alone transfers all title in the property, subject to the satisfaction of any claim established in the outstanding warrant. If the merchandise is not used as collateral, the seller delivers both warrant and receipt to the buyer.

The holder of a warrant by indorsement should cause the fact to be registered at the warehouse, as no binding reindorsement can take place unless the fact of registration appears upon the instrument itself. If the holder of the receipt does not know the holder of the warrant, he needs but to pay into the general warehouse the sum due to the owner of the warrant, whereupon he may take delivery. In default of payment of a debt guaranteed by a warrant, the holder of the same may cause the sale of the merchandise at public sale, eight days after protest, and he becomes a preferred creditor, after deduction for expenses of sale, storage, and local or State taxes. The excess, should there be any, is then paid to the holder of the receipt.

To the depositor of merchandise who wishes storage facilities only is given a receipt, with a number of coupons attached, which, being filled out, authorizes the holder to take delivery of so much of the goods as may be mentioned. The warehouse insures upon request, or the goods may be covered by a floating policy.

Many banks which make loans upon merchandise refuse to do so upon delivery of an ordinary warrant; they insist upon having a nantissement, which by its terms transfers to them an absolute title in the property. The same protection is offered by a properly indorsed warrant, but more bookkeeping is involved than in the case of a nantissement. The borrower upon a nantissement must have confidence in his banker, of course, as the latter has power to do as he pleases with the goods.

EXAMINATION OF GOODS.

The assumption of the Department's correspondents that receipts and similar documents pass current as collateral without investigation of the goods covered is not correct, in Marseilles at least. The statement of the general warehouse that a given quantity of merchandise has been deposited is never questioned, but before making a loan the banker sends the papers to his broker, who reports on the actual value of the property, either from his knowledge of the marks submitted or after a personal visit. If the report is satisfactory, an advance of 75 per cent is made to the borrower, who pays therefor the current rate of interest, which at the present moment is 3 per cent per annum. The borrower also pays a stamp tax amounting to 50 centimes (9.65 cents) per 1,000 francs ($193), and a further charge of one-fourth of 1 per cent every three months by way of banker's compensation for making out and renewing papers, and a fixed charge of 8 francs ($1.54), which goes to the banker's broker for his expert services. The amount of these various charges brings the present cost of a loan up to 3¾ per cent per annum.

THE MARSEILLES BOURSE.

The system seems to be efficient, inexpensive, and seldom abused. Confidence in the documents issued exists in France, as in the United States it exists in the national banks, not only because of the guaranties established by law, but because final supreme power to regulate these matters vests in all the members of the world of commerce. This commercial world is sheltered by the bourse—not a limited-liability company, membership in which becomes a purchasable commodity, but a national institution existing for the convenience of all those who have paid taxes in exchange for the right to transact business.

The bourse is a true democracy, with its legislative, executive, and judicial departments. The legislative branch is called the chamber of commerce, and the one in Marseilles is the oldest in France, having had a continuous history since 1599. The local chamber consists of twenty-one members, who not only control the policy of the bourse, but correspond directly with the National Government, offering advice on every conceivable subject. The chamber is the mouthpiece of the business community. The president has an executive staff, who keep the bourse machinery in motion. The commercial judiciary is known as the tribunal of commerce. The members are chosen at what are called "consular elections" by all patented merchants, and are themselves actually engaged in trade or manufacturing. This tribunal has final judgment in cases involving less than 1,500 francs ($289), and in insignificant cases, or cases involving commercial rule and practice, is more a board of arbitration than a tribunal. The fees are trifling and the judgments of the court are highly respected. In addition to determining causes, the tribunal names experts and facilitates in countless ways the settlement of vexed matters.

ROBERT P. SKINNER,
Consul-General.

MARSEILLES, *June 19, 1902.*

REPORT FROM NICE.

There exists in Nice an incorporated company having for its object the storing of goods and advancing of loans upon such goods as collateral. The capital of the company is 1,250,000 francs ($241,250) and from the date of its incorporation, some fifteen years ago, its dividends to shareholders have varied between one-half of 1 per cent and 1 per cent per annum. This company, known as the Société Générale des Docks et Entrepôts de Nice, does a general storage business; it owns the only bonded warehouse in the town, having obtained an exclusive concession therefor from the customhouse authorities, and has tank accommodation for about 1,000,000 kilograms (2,204,600 pounds) of olive oil; it furnishes barrels and hogsheads for the storage of wines and spirits, and has spacious wine cellars; it possesses facilities for the storage of furniture, trunks, valises, jewelry, bonds, and general merchandise, and is prepared to guarantee the delivery of such goods stored, in perfect condition and good order. It is prepared, further, to undertake the care and storage of merchandise of a more or less perishable nature.

WAREHOUSE RECEIPTS.

The company issues two series of receipts for goods stored in and out of bond. One series refers to simple storage of goods which are not intended to be negotiated or sold, and the other, known as warrants, are for goods which may be negotiated and may serve as collateral for loans. The company has been authorized to operate by virtue of a decree of the Government, and has a surety bond of $5,000. Notwithstanding this, there is no governmental, prefectoral, or any other supervision over the operations of the company, or upon the values of goods represented by the warrants. Although banks and bankers are prepared to advance from 50 to 70 per cent of the value of goods represented by the warrants, they recognize that there is no specific guaranty as to their integrity; and when they are offered as collateral, banks and bankers proceed to investigate the matter thoroughly and always demand an estimate of the value of the goods by an expert before accepting the warrants.

It may be said, therefore, that as far as this city is concerned the existing system does no more in practice than guarantee the existence of certain merchandise. I may add that banks and bankers also take into careful consideration the character and reputation of persons offering the warrants.

HAROLD S. VAN BUREN,
Consul.

NICE, *July 25, 1902.*

REPORT FROM ROUBAIX.

The law of 1858 provided for the creation of a greater number of storehouses and authorized them to receive goods and issue negotiable receipts under the following conditions: The prefect grants the permission after consultation with the chamber of commerce or the consulting chamber of arts and manufactures or the tribunal of commerce. Before receiving permission to open a warehouse, the applicant must give bond not exceeding 100,000 francs ($19,300).

At Dunkirk, in addition to the Compagnie des Entrepôts Magasins Généraux de Paris, the chamber of commerce and MM. C. Bourdon et Cie. have been authorized to open warehouses. The three companies have a capacity of from 150,000 to 200,000 tons.

During the past year, 1,000 warrants were delivered by the chamber of commerce against deposits of sugar valued at 17,000,000 francs ($3,300,000). Eleven million francs ($2,120,000) were advanced by bankers.

In Lille and in Roubaix-Tourcoing, there is a large warehouse under Paris management. There are also special storehouses for the deposit of wool and cotton. There is constant speculation on the deposits of wool and cotton in these warehouses.

W. P. ATWELL,
Consul.

ROUBAIX, *June 27, 1902.*

REPORT FROM ST. ETIENNE.

Some banking houses—the Credit Lyonnais in particular—grant advances of money on raw silk to merchants who ask for it. The merchandise is stored by the banks in their cellars at 5 per cent per annum for the storage. The merchants have also to pay for the insurance of the goods, and a small commission every three months.

When the silk is low in price, as at present, the banks lend from 75 to 80 per cent of its value, and when it goes up they lend much less.

No money is lent on any other kind of goods in St. Etienne.

As a general rule, the banks like to accommodate only solvent houses, not caring to encourage those of doubtful reputation.

Of course, the banks do not deliver the merchandise until the loan, with the expenses, is refunded.

HILARY S. BRUNOT,
Consul.

ST. ETIENNE, *July 9, 1902.*

GERMANY.

GENERAL REPORT.

There is no national law governing this subject throughout the whole of Germany. The free and independent Hanseatic cities of Hamburg, Bremen, and Lübeck, notwithstanding their inclusion in the new German Empire, still retain to a very large degree their original legal sovereignty. As regards the rest of Germany, legislation on this subject has been expressly left to the individual States. The German commercial code only lays down general principles concerning the warehousing business, and practically leaves that phase of it which is here in question untouched.

In respect to their form and scope, the warehouse receipts in use are of three classes, viz: The first is the "Rektalagerschein," a simple nonnegotiable warehouse receipt; the second is the "Orderlagerschein," a warehouse receipt to A. B., or order, and transferable by simple indorsement; the third, and the one which concerns us most, is the "Lagerpfandschein," or warehouse-pledge receipt. Experience has shown that the establishment of a successful system depends upon the observance of the following essential principles: First, a sharp distinction between warehouse receipts which serve to transfer the legal title to the property described therein and "pledgable warehouse receipts," or warrants, which are somewhat in the nature of chattel mortgages; second, set "forms" or "blanks" and an authoritative statement of their essentials, analogous to the statement of essentials and the forms prescribed for notes and bills of exchange by the bills of exchange act; third, an authoritative statement of the legal relations between the possessor of the "Lagerschein," or warehouse receipt, and the holder of the Lagerpfandschein, or pledgable warehouse receipt, both before and after the loan becomes due and payable, as shown by the due date of the

Lagerpfandschein. To understand the above it must be remembered that where it is desired to effect a loan, either the Lagerpfandschein may be used or both—the one to transfer the legal title, the other to create a lien on the goods for a loan or otherwise.

Up to the present, there would appear to be only two localities in Germany where the subject is regulated in a proper way by statute, namely, in the Hanseatic seaport of Bremen and in the annexed territory of Alsace-Lorraine, where the system was doubtless introduced while that part of Germany was still a French province.

The first condition necessary to the establishment of a successful system of negotiable warehouse receipts or dock warrants, capable of being pledged with facility as collateral, is a system of warehouses licensed or controlled by the state and authorized to issue negotiable paper of the kind in question, for it is obvious that such collateral can only be of value to the extent to which the goods described therein are actually in existence and stored in the warehouse under the custody of the warehouseman. Unless some guaranty other than the personal honesty and integrity of the warehouseman is afforded in the shape of state control or supervision, the value of the collateral will never be higher than the financial reputation of the warehouseman, and facility in effecting loans will always be hindered by the necessity of the lender first satisfying himself of the responsibility of the custodian in question and assuming the risk of his continued honesty and integrity.

The basis for a successful system can be laid on the lines of the Dutch, French, Belgian, or Austrian statutes, in all of which countries this subject has for a long time been systematically dealt with, both in statutes and in the decisions of commercial courts. The system practiced in Bremen is the only one that conforms to modern commercial requirements, and, as already stated, that conforms closely to the methods established by the laws of France and Holland. The Austrian law is frequently cited as eminently enlightened, practical, and satisfactory in its workings. The enactment of an imperial statute on this subject for the whole German Empire has been advocated during the past ten years, and such a measure has even been drawn and considered by the associated bankers and merchants of Berlin, but thus far no legislative action has been taken to replace the present obsolete and imperfect system by a comprehensive law based on the conditions and requirements of modern commercial practice.

FRANK H. MASON,
Consul-General.

BERLIN, *July 23, 1902.*

REPORT FROM BAMBERG.

In one of the most important ports of Germany, it happens frequently that loans are made on merchandise stored in warehouses, and there exist for these transactions very strict legal regulations. The largest of these associations for storage (Bonded Warehouse Company) is under the direct control of the Government, and therefore its warrants are accepted by most of the banks on simple indorsement, whereas the warrants of private warehouses are subject to stricter supervision. The amount of the loan is agreed upon on the basis of values on the exchange (Börse) or according to the market value of the samples produced. The conditions for rate of interest, insurance, and other matters are agreed on separately between the parties to the contract. One of the principal banks of the port issues the following conditions, under which it agrees to make advances on merchandise in storage:

This bank agrees to advance money on warrants indorsed by the Bonded Warehouse Company. Other advances are made on merchandise held by private warehouses on the condition that the respective owners are acceptable to the bank, and that they use for warrants the formulas prescribed by this bank.

The taxation of the merchandise is made at the expense of the borrower, by experts appointed by this bank for such purpose.

The bank is not responsible for leakage, nor for shrinkage or spoiling of the merchandise; nor is it liable for loss or damage caused by force majeure, or by the natural condition of the goods or by neglect in packing the same. All such losses or damages shall be borne by the owners without any claim whatsoever against this bank. In case a claim for borrowed money, after such claim is due or partly due, can not be paid back promptly by the borrower, this bank shall be entitled, without previous warning, to sell the loan (pawn) in order to pay itself for all its just demands against the borrower for capital, interest, and expenses, on the condition of having a legal claim for any amount not covered by the proceeds of the sale. There shall be no obligation to sell at once, the time for such sale being entirely subject to the judgment of this bank. For a forced sale of the merchandise or the warrant for it, this bank is entitled to one-half of 1 per cent commission.

During the duration of the loan, this bank takes care of the insurance of the goods at the expense of the borrower, provided there are not deposited with it open policies or policies in favor of the Bonded Warehouse Company. These policies must cover the full value of the merchandise and must be issued by companies that are under State supervision and agreeable to this bank. The claims to be made in case of a loss on the basis of these policies are to be considered as credited and indorsed over to this bank and the bank entitled to collect the amount of insurance.

W. BARDEL,
Commercial Agent.

BAMBERG, *June 24, 1902.*

REPORT FROM BREMEN.

The Warehouse Company of Bremen (Bremer Lagerhaus Gesellschaft) is authorized to store merchandise and other movable articles. Therefore it is empowered to issue warehouse receipts and warrants having legal validity.

Merchandise stored with this company may, by surrendering the indorsed warehouse receipt, be transferred as collateral. Besides the warehouse receipt, a warrant is issued, which also shows that the goods mentioned in the receipt and warrant are pledged to the holder of these documents for a certain sum of money.

The goods thus used as collateral will not be delivered to the holder of such a warrant until the value is deposited with the warehouse or storage company. Accordingly, these warrants give to the lender security for money advanced on the merchandise, and render it possible for the owner of the merchandise to sell the goods before the money borrowed has been paid back, by transferring the warrants to the buyer of the goods. The rules are translated below:

1. The warehouse receipts and warrants are issued according to the appended forms:

The warehouse receipt contains: Name and residence of storer; description, quantity, and marks of the merchandise; date of issue; register number and signature of company.

In case a warrant is issued, it must contain: Amount of loan and interest (provided the latter is payable at maturity); date of payment; place of payment; name of lender.

The warrant contains the same notes, and besides: The certificate of the board of directors of the company, showing that the loan has been entered upon the registers of the company and noted on the storage receipt.

Both papers may be issued by the company without showing the name of the lender.

2. If a holder of a warehouse receipt demands a warrant, he has to return the receipt with his application.

3. The company insures all goods, subject to warrants, against loss by fire. The insurance must cover, at least, the warranted sum.

4. The company is authorized, but not bound, to store goods of different kinds on one warehouse receipt.

5. Whenever a parcel of goods, covered by only one warehouse receipt, is to be broken or divided, the receipt and also the warrant, if there be any, must be returned to the company, which will then issue new receipts and warrants. For each warehouse receipt and each warrant, a fee of 50 pfennigs (12 cents) is to be paid, besides 50 pfennigs for a revenue stamp.

6. The company enters the sum of money covered by warrant upon its books, and certifies to this entry on both the warehouse receipt and the warrant.

7. The surrender of the indorsed warehouse receipt is equivalent to the surrender of the goods.

8. The company considers every holder of a warehouse receipt as the person exclusively authorized to dispose of the goods; at the same time, every holder of a warrant as the person authorized to prosecute all claims against the company resulting from the warrant. It is empowered to closely look into the validity of the indorsements and receipts on the warehouse certificates and warrants.

9. By the surrender of the indorsed warrants, the lender acquires full title to the goods as security. Both the claim and the dead pledge are transferred to the party of the third part by the surrender of the indorsed warrant.

10. The holder of the warehouse receipt, who is not also the holder of the warrant, has the right to redeem the warrant before it becomes due by paying the money advanced on the goods and the interest. In case the company, in its own best judgment, becomes convinced that the holder of the warrant is not known, or is absent, or that the creditor can not be made to agree with him as to the payment, the holder of the warehouse receipt may deposit with it the amount of the warrant, whereupon the goods will be made subject to his order. If the amount is overdue, he will also have to deposit 6 per cent interest from date of maturity. If the amount has not yet become due, the sum will be deposited, until maturity, with some safe bank or broker, and the interest collected thereon refunded to the depositor. The company is not obliged to give notice of such deposits to the holder of the warrant.

11. If the amount of the warrant has neither been paid nor deposited on the day of maturity, the warrant must be presented, at the latest, on the second week day after the date of maturity at the place of payment to the first creditor, and, in case of nonpayment, must be protested through a notary public at the place of payment.

12. If the amount of the warrant, including 6 per cent interest from the date of maturity, and the cost of protesting be not paid or deposited within three days from date of protest, the holder of the warrant may demand, in writing, the sale of the goods by surrendering the protest and warrant. The first creditor, having redeemed the warrant, has the same right at the expiration of seven days from the day of payment, provided no protest has been entered. If the date of sale and the number of previous notices have not been mentioned by the mover for the sale of the goods, the company itself determines both according to the following paragraphs:

13. The sale is conducted publicly by an official of the company or by a licensed broker. The sale is to be announced in three newspapers, on two different days, without mentioning the name of the mover. The company may have samples of the goods drawn, and may permit bidders to inspect and sample them, as is usual with auctions.

14. From the receipts, payments are to be made in the following order: (*a*) For the expenses of selling, for which the company charges 1 per cent commission; (*b*) for the company's claims for storage, for expenses for the care of the goods, insurance, etc., from date of warrant; (*c*) for the amount of the warrant, including 6 per cent interest from date of maturity, to the holder of the warrant; (*d*) for all other claims of the company for costs, etc.; and (*e*) the balance is to go to the holder of the warehouse receipt.

15. Should the receipts but partially cover the warrant, the company and the holder of the warehouse receipt indorse said amount on warrant, and the warrant will be returned.

16. The same rules will be carried out if the holder of the warehouse receipt employs the company to sell the goods.

17. When a pledge is given by the surrender of an indorsed warehouse receipt, the indorsement is accepted as proof in writing that the holder of the pledge is empowered, without further legal proceedings, to sell the goods according to the above rules through the company.

18. The rights of the warehouse-receipt holder and those of the warrant holder to

the goods stored by the company include all claims for damages in cases of loss or injury, especially in case of damage by fire.

19. Whoever stores goods with the company, or accepts a warehouse receipt or warrant, thereby submits to the governing rules and all future alterations thereto; also to the Bremen law of May 13, 1877, touching warehouse receipts and warrants, and to such rules and regulations of the German commercial statutes as are applicable.

HENRY W. DIEDERICH,
Consul.

BREMEN, *October 1, 1902.*

REPORT FROM BRESLAU.

In this consular district, there is no warehouse system such as is evidently contemplated by the Department instruction; the only thing of the kind is what is known as Lombard loans, a method of loaning on stored goods which might be regarded as a sort of hypothecation, if it were not for the fact that such restriction and supervision are exercised by the lender as give him virtual possession of the goods as a pledge.

The following are some of the regulations made by the Reichsbank regarding such loans:

No loans below 500 marks ($119) are made.

No loans are made for a longer time than three months.

Loans may be repaid at any date, and can be demanded at any time without previous notice.

All that is required to call in the loan is a registered letter from the lender demanding the same.

If the debtor fails to pay the debt or the interest when called for, the Reichsbank is entitled to sell the goods and from the proceeds reimburse itself for the loan, interest, and costs.

To secure the safety of the goods, or for the sale of same, the Reichsbank has the right to remove them, at the risk and cost of the borrower, to another storage place.

The interest is payable every three months, and, if possible, at the end of the calendar quarter.

The storage place of the goods is placed in the control of the Reichsbank.

The goods can not be removed to any other place of storage without the permission of the Reichsbank.

Changing the storage place of goods does not affect the bank lien.

The storage place of the wares upon which the loan is made and the date of appraisal must be stated in the pawn note (Pfandschein), which note is not negotiable.

The Reichsbank is not responsible for damage to the goods, even if in the bank's buildings, unless arising through its own extreme carelessness.

Any expenses occurring through the transportation, appraisal, storage, care taking, repacking, etc., of the wares are to be at the borrower's expense.

If the goods depreciate one-sixth of their appraised value through changes in the market or an alteration in their condition during storage, according to an estimate made by a bank official or other expert, the loan is to be further secured by new collateral or proportional payment of the loan.

ERNEST A. MAN,
Consul.

BRESLAU, *August 23, 1902.*

REPORT FROM FRANKFORT.

Frankfort has a municipal warehouse which furnishes to the depositor of the goods certificates for the purpose of effecting loans on them. These certificates are issued at the request of the depositor of the goods, and are made out in his name upon a blank form supplied by the warehouse management. In order to obtain such a certificate, the goods have to be insured through the warehouse management, and it must be shown that they do not appear upon the books as previously hypothecated.

The certificate must be signed by the director and the manager of the warehouse, and must contain the following data:

1. The name and residence of the firm by which the goods were stored.
2. The number, kind, and mark of the packages.
3. The quantity, weight, or measure of the goods.
4. The number of the book of the warehouse in which the entry is made.
5. The day when the goods were stored.
6. The charges due on the goods on the day of issue of this certificate.
7. The amount of insurance on the goods.

At the request of the depositor, and at his expense, the warehouse management will have the goods appraised by an expert chosen by the management and the amount stated on the certificate, but the management assumes no responsibility for the correctness of the appraisal.

If the depositor and the party making a money advance on the goods notify the warehouse management that the goods have been pledged and that the certificate has been delivered to the creditor, and the request is made to keep possession of the pledged goods for the latter, the management notifies him in writing and retains the goods in its possession until notified by the creditor that the goods have been released and again placed at the free disposal of the depositor. During such time, the management keeps up the fire insurance to the amount of the value of the goods appearing on the certificate. The management assumes no responsibility for the correctness of the statements in the certificate with reference to the weight and quality of the goods.

The creditor or his agent is entitled to inspect the goods on presentation of the warehouse certificate, during business hours, and to make provisions for preservation at their own expense.

The tax for issuing the certificate for loan purposes is 1 mark (24 cents).

RICHARD GUENTHER,
Consul-General.

FRANKFORT, *July 15, 1902.*

REPORT FROM HAMBURG.

Goods stored in warehouses are used as collateral for loans in Hamburg; however, the banker making the loans does not possess full security, as he generally accepts the respective warehouse or other receipts and only requires that, for the time being, the goods in question be assigned or transferred to him by the owner of the same.

As a rule, every such case is dependent up the faith of the banker in the merchant borrowing money and in the individual warehouseman or company signing the receipt. It is generally understood that such loans are not made to persons of questionable character or standing, or when there is any doubt as to the responsibility of the warehouseman in charge of the goods. Notwithstanding, it happened, a few years ago, that a local bank made loans on certain goods which actually were not in charge of the person from whom it accepted documents as security, and heavy losses to the bank were the result of this transaction.

There is no supervision here of warehouses, either corporate, State, or national, on which bankers and trust companies can depend for the existence of the collateral or its value, if existent; and bankers doing this kind of business have actually no full security for loans thus made, unless they persuade themselves of the existence of the collateral by personal inspection or examination.

HUGH PITCAIRN,
Consul.

HAMBURG, *July 2, 1902.*

REPORT FROM HANOVER.

It is not the general practice in the province of Hanover, except in the city of Hameln, to use stored goods as collateral for loans. Hameln, being on the Weser, is influenced, it is said, by the manner of doing business at the seaports.

The board of trade appoints a commission to investigate the conditions under which any new company is to start business, and should the result not be satisfactory the board refuses to register the company. It does not appear, however, that there is any further corporate, municipal, or State supervision of warehouses.

The Reichsbank and other banking establishments advance money on goods stored, upon the production of a warehouse warrant and sample. The goods may also be kept in a bonded warehouse under the supervision of customs authorities. The warehouse keeper is naturally responsible with his private fortune in case of irregularities, if his business is not organized as a limited company; in any event, guilty persons are liable to imprisonment.

It appears that the banker depends for his security chiefly upon the integrity and good faith of the warehouseman.

I append translation of the regulations.

JAY WHITE,
Consul.

HANOVER, *September 25, 1902.*

WAREHOUSE REGULATIONS.

According to the regulations stated here, we agree to take charge of goods made over to us for storage on payment of the fee agreed upon.

We undertake and reserve the execution of all work in connection with the receipt and delivery of the goods mentioned and as regards the handling of the goods generally.

By order and for account of the person storing, we arrange the settlement of accounts in regard to freight and duty and other fees attaching to the goods on arrival. Likewise, if so desired, we undertake the forwarding of said goods on terms given or agreed upon.

The customer has to reimburse in cash at once our expenses for freight, etc. For advancing money, we charge a commission of one-half of 1 per cent.

In case the goods handed over to us are damaged, we hold ourselves responsible for the damage only so far as is proved that it has been caused by carelessness on our part or on the part of our employees. We are therefore not specially responsible for damage caused by force majeure, for waste, deterioration, or decay, owing to the peculiarities of the wares or defective condition of same, or for losses and damage caused by faulty packing or prolonged storage.

Our responsibility begins as soon as the goods are stored and ceases at the delivery of said goods. If the customer is dilatory in payments or otherwise, any claim to responsibility is forfeited.

Likewise, we assume no responsibility in the event of false or incorrect statements being made as to contents of bales, etc. The customer is answerable for the consequences of said false statements.

A claim for indemnification can be made only during the time of our responsibility. The goods are insured by us with a fire-insurance company selected by us.

If the value of goods has not been given, we insure at the quotations of the day.

In case goods are to be withdrawn from the storing house, the customer has to communicate his directions in writing at least one day preceding the withdrawal of the goods.

With regard to the scale of our fees, we take as a basis of calculation the weight stated to us at the arrival of goods or the gross weight of same, if the goods are weighed out.

Our fees, including expenses, are settled every month, and have to be paid—cash—at once.

As security for all claims on our customers, we have a lien and right of retention on the goods stored with us, and on the claims which take their place—*i. e.*, reimbursement in case of damage caused by fire, etc.; also to all amounts deposited instead of goods.

In case the customer is dilatory in paying or in taking the goods back, we are also entitled to reimburse ourselves by selling goods for the person's account without any legal proceedings, according to article 311 of the German general commercial laws.

In case demand is made for a portion of the goods put down in the warrant, the latter has to be presented for a record of the deductions. In case demand is made for the whole quantity, the warrant has to be given back.

In case the customer cedes his rights with regard to the goods stored, or in case these goods are mortgaged, a corresponding remark referring to the cession is put down in the warrant, whereupon the latter is handed over to the transferee, without whose consent the goods are not delivered to anybody.

REPORT FROM MUNICH.

The following regulations of the Munich City Storage Warehouse and tariff of charges have been received from Consul J. H. Worman, of Munich:

[Translation.]

WAREHOUSE REGULATIONS.

1. The Munich City Warehouse (Munich, Southern Station) is a city institution for the purpose of storing, according to instructions, domestic and foreign merchandise, of handling the same while on storage, and of forwarding it. It is under the management of the municipality.

According to a decision of the Royal Government, the city warehouse is declared to be a transit warehouse for grain, malt, and other articles embraced in No. 9 of the tariff.

2. The business of the city warehouse embraces in detail especially the following departments: (*a*) Storage of merchandise and handling the same according to the available room; (*b*) unloading and loading the merchandise to be stored; (*c*) executing the orders for forwarding the merchandise; (*d*) collecting the freight, duties, and other charges; (*e*) collecting the revenue of the city on merchandise forwarded by rail.

The articles preferred for storage are grain, oil seed, mill products, malt, pulse, seeds, and similar wares.

For the extension of the business and of the list of articles to be stored, the consent of the municipality is necessary.

3. The management of the business, under the supervision of the municipality, is intrusted to the manager, and the handling of the money to the cashier. For the internal and external service of the management, the necessary help will be provided by the municipality.

The warehouse manager is the chief of the staff of officials and of employees. All complaints against the officials and employees are to be preferred to the manager.

The necessary financial control is lodged by the municipality in a controller, who also represents the manager in the latter's absence.

4. The warehouse charges are established by the tariff. The payment of the city revenue is governed by the local municipal police regulations.

5. The action of the warehouse management with reference to stored merchandise depends upon the orders of the depositor. All orders must be in writing. No responsibility is assumed for the execution of verbal orders. Telegraphic and telephonic orders will be carried out, but the person giving such orders must assume the responsibility of any error in the wording or interpretation.

In exceptional cases of necessity, the warehouse management is authorized to take independent action for the protection of the merchandise. The resulting charges must be paid by the depositor.

When the stored merchandise is so damaged as to endanger other goods stored, the management has the fullest authority to dispose of the same at the cost of the depositor.

6. Consigned shipments will be warehoused by the management for account of the consignee, as given by the consignor in the bill of lading or in any other written direction. But when the consignee is not named and refuses to accept the goods, they will be warehoused for account of the consignor.

The weight and the external condition of the consignment will be investigated immediately upon arrival of the merchandise. The established differences in weight and other irregularities will be communicated by the warehouse management to the railway officials and the consignee.

Reclamation from the railway officials will be made by the intervention of the warehouse management, when the request so to do by the consignee is accompanied by a specified statement.

7. The warehouse management will accord to its customers the benefit of the cheaper freights and exceptional tariffs granted it in direct communication with the railways.

The management can, according to the regulations issued by the municipality, from time to time, so far as the warehouse goods afford the security required by paragraph 10, give credit for freight charges and duties or make interest-bearing advances.

8. Regular customers of the warehouse will be allowed to settle their accounts monthly.

All payments to the management will be made in Munich in cash to the cashier of the city warehouse, and will be credited by the warehouse management eight days after receipt, as this period is necessary to settle with the railway, the banks, and other offices, and the delay is unavoidable in order to make payments to them.

All receipts for payments, to be valid, must be signed by the cashier and countersigned by the manager.

9. The entire amount of merchandise of a depositor warehoused from time to time is liable as a pledge to the municipality of Munich for its claims of every kind, particularly for warehouse charges and costs, freights, duties, cash advances, interest, and all expenses and city taxes (octroi).

The warehouse management is authorized, whenever the amount due is not paid or sufficiently secured, to sell the merchandise of a debtor warehoused at the time, without judicial proceedings, according to its own discretion, and to reimburse itself for the claim of the municipality out of the proceeds.

In so far as the city warehouse has other legal rights, they are not affected by these provisions.

10. The liability of a customer must not at any time exceed two-thirds of the value of his warehoused merchandise. The value of warehoused merchandise will be determined, according to the current price, by the warehouse manager in conjunction with the controller. If it does not afford sufficient security, the warehouse management is authorized to proceed as provided in paragraph 9.

11. Arrangements have been made to enable loans to be made by third persons. This is dependent upon the warehouse management, in so far as the unhypothecated merchandise on storage is held as security for the entire claim of the municipality of Munich. Merchandise upon which advances have been made by a third party is liable to the municipality of Munich in the first instance.

12. The city warehouse is guarded during the night by watchmen. The premises are insured against loss by fire. In case of loss by fire, the losers will receive damages in proportion to the fire losses paid by the insurance companies.

13. Smoking is forbidden in the storage rooms.

14. All general regulations of the municipality of Munich relating to the city warehouse will be published in the Munich Official Gazette.

15. All persons doing business with the city warehouse by warehousing merchandise, making advances on the same, or in any other manner, are subject to the warehouse regulations, the tariff, and all regulations of the municipality published in the Official Gazette.

16. These revised warehouse regulations go into operation at once. At the same time, the warehouse regulations of June 30, 1882, are annulled.

TARIFF OF CHARGES.

1. For merchandise warehoused in the city warehouse, the following fees will be collected:

Articles.

Class I. Grains of all kinds; malt and maize.

Class II. Flour, mill products, pulse, oil seed, and seeds; malt in closed cases, and other voluminous articles.

Fees.

The fees are understood to be, with the exception of insurance premiums (paragraph 10), for carloads of 10,000 kilograms (22,046 pounds):

Description.	Charge.	
	Marks.	
1. Yard fee for each carload, including switching	3.50	$0.83
2. Transshipping from one car to another, or unloading into wagons, without weighing	4.00	.95
3. Transshipping from one car to another, with weighing	6.00	1.43
4. Unloading, warehousing, and stacking or emptying	4.50	1.07
5. Shipping from warehouse and loading:		
In car	4.50	1.07
In wagon	5.00	1.19
6. Transferring from one warehouse to another	5.00	1.19
7. Storage for 8 days:		
Class I—		
In bags	2.00	.48
In bulk	3.00	.71
Class II—		
In bags	3.00	.71
In bulk	4.00	.95
8. Storage for first month:		
Class I—		
In bags	4.00	.95
In bulk	6.00	1.43
Class II—		
In bags	6.00	1.43
In bulk	8.00	1.90
9. Storage for each succeeding month:		
Class I—		
In bags	2.00	.48
In bulk	3.00	.71
Class II—		
In bags	3.00	.71
In bulk	4.00	.95
10. Insurance premium for 100 marks per month	.04	.01
11. Fee for advances	3.00	.71
12. Weighing in bulk	3.00	.71
13. Weighing in detail	4.00	.95
14. Equalizing the weight in bags	4.50	1.07
15. Sorting the merchandise or mixing flour	4.00	.95

Description.	Charge.	
	Marks.	
16. Transferring to other bags, bagging, or emptying:		
(*a*) Without weighing	4.00	$0.95
(*b*) With weighing	6.00	1.43
17. Emptying into heaps and mixing with shovels	5.00	1.19
18. Mixing with shovels, without emptying	2.00	.48
19. Emptying, mixing, rebagging, and weighing	10.00	2.38
20. Emptying, mixing, rebagging, weighing, and equalizing	11.00	2.62
21. Cleaning with hand windmill	9.00	2.14
22. Cleaning by machinery (excluding oats) with—		
(*a*) Wind	10.00	2.38
(*b*) Wind and sorting cylinder	14.00	3.33
(*c*) Wind and culler	18.00	4.28
(*d*) Wind, sorting cylinder, and culler	21.00	5.00
(*e*) Wind, sorting cylinder, culler, and separator	24.00	5.71
(*f*) Cleaning oats by machinery, in addition, per wagon	10.00	2.38
23. Bagging and weighing, in connection with paragraphs Nos. 21 to 26, inclusive	6.00	1.43
24. Bagging and equalizing, in connection with paragraphs Nos. 21 to 26, inclusive	6.00	1.43
25. Restacking the bags	2.50	.60
26. Transporting and emptying the cleaned wares in heaps	2.00	.48
27. Transcribing fee, each warehouse entry	1.00	.24
28. For strings and small repairs to bags	.40	.10

NOTE.—In calculating warehouse fees, fractions of a month will be reckoned as a full month.

Compound tariffs are reckoned only when the manipulations are carried on without interruption.

When the charges, according to the foregoing tariff, from the 1st of January to the 31st of December, inclusive, amount to at least 1,000 marks ($238), a discount will be allowed as follows:

	Per cent.
1,000 to 3,000 marks ($238 to $714)	1
3,001 to 5,000 marks ($714.24 to $1,190)	2
5,001 to 10,000 marks ($1,190.24 to $2,380)	3
10,001 to 15,000 marks ($2,380.24 to $3,570)	4
15,001 to 20,000 marks ($3,570.24 to $4,760)	5
20,001 to 25,000 marks ($4,760.24 to $5,950)	6
25,001 to 30,000 marks ($5,950.24 to $7,140)	8
Over 30,000 marks ($7,140)	10

Transport of merchandise to the city will be provided for as far as possible and charged for at cost price.

2. Fees for empty sacks per 1,000:

For—	Charge.	
	Marks.	*Cents.*
Counting	.10	2.3
Tying in bundles	.10	2.3
Weighing	.10	2.3
Warehousing	.10	2.3
Loading	.10	2.3
Sealing	.10	2.3
Transporting to or from railway	.20	4.7
Rent per week	2.00	47.6
Repairing per piece	.04	1

3. For sample bags, postage, and custom-house blanks, only the actual cost will be reckoned.

For work which is not provided for in the tariff, as well as for shipments in larger number of sacks or greater weight, the charges will be fixed by the warehouse manager in conjunction with the controller.

MUNICH, *January 1, 1896.*

SUPPLEMENT.

[Publication by the municipality, March 5, 1897.]

The fees provided for in the tariff of fees for the city warehouse of January 1, 1896, are understood to be for the handling of empty bags in connection with regular warehouse consignments. For simply warehousing empty bags, an extra charge of 10 pfennigs (2.3 cents) per 100 per month must be paid.

Regulations.

1. Upon the written request of the owner of warehoused merchandise, a warrant will be issued in his name and to his order, for which a fee of 3 marks (71.4 cents) per wagon will be charged. Such warrants may be issued by the manager of the warehouse, countersigned by the controller.

2. Such warrants must contain: (*a*) The name, business, and residence of the owner of the warehoused merchandise; (*b*) the weight and kind of goods and character of packages; (*c*) the warehouse number under which the goods are entered; (*d*) the amount for which the goods are hypothecated at date of the issue of the warrant.

3. These warrants can, according to articles 302 to 305 of the German general commercial regulations, be transferred by indorsement.

4. The bearer of an indorsed warrant is identified, according to the provisions of article 36 of the German general exchange regulations, as the legal owner thereof by continuous indorsement to him.

Notices by the warehouse management which affect the goods covered by the warrant are legally given to the last indorsee of the warrant entered in the books of the city warehouse.

5. The owner of a warrant is entitled, upon production of the same during the usual business hours of the city warehouse, to inspect goods covered by the warrant, to dispose of the said goods, and, upon surrender of the warrant and the payment of the claims and demands of the city warehouse, to withdraw the same.

6. Every warrant can, upon written request of the holder, be exchanged for other warrants covering portions of the goods, upon payment of a fee of 1 mark (23.8 cents) per wagon.

7. The goods covered by a warrant are liable to the municipality of Munich for the claim of the city warehouse noted on the warrant, and for all further accrued claims of every kind against the said goods as security after the issue of the warrant.

8. Lost or mislaid warrants may be redeemed in accordance with the existing legal provisions (Imperial Code of Civil Procedure, paragraph 837 et seq.). After the institution of proceedings for the redemption of a warrant, the warehouse management is authorized to deliver the goods upon the giving of security.

9. The regulations of the Munich City Warehouse (Warehouse Regulations and Tariff of Fees) apply to goods for which warrants are issued, except in so far as the same are expressly modified by the foregoing provisions.

REPORT FROM PLAUEN.

The following information is taken from Das Handelsgesetzbuch, or Commercial Laws, written by Dr. jur. Richard Behrend, and is the most satisfactory information that I could obtain on the question.

It would seem that there is no official warehouse system, except for goods passing through the custom-house.

Section 416 of the above book says:

> A storehouse keeper is one who undertakes the storing and keeping of goods as a trade. He is, in a way, regarded as a commissioner.

Section 388 says:

> If the goods delivered to the commissioner are in a damaged or defective condition at the time of delivery, the commissioner should preserve his right against the shipowner or freighter, to whom he must give immediate notice, otherwise he will be responsible and liable to indemnity through his neglect.

It is further stated that—

> If the goods are damaged, or if by keeping them their value would be further diminished, and if there is no time to communicate with and receive the orders of the owner, or in case of negligence of the owner, the commissioner may make sale, according to rules in section 373.

Other sections provide:

> SECTION 373. The seller, or commissioner, after having given due notice, can have the goods sold at public auction, or through a public broker entitled to make such sales, and it requires no preliminary notice, if the goods are in danger of spoiling or if notice is impracticable. In case of public sale, the commissioner must inform the owner of the time and locality of the sale; he must also give notice when the sale is perfected, and in case of neglecting this, he is liable to indemnify the owner.
>
> SEC. 390. The commissioner is responsible for the loss or damage of the goods under his custody, unless the loss or damage happened under circumstances which could not be prevented by ordinary care.
>
> The commissioner is responsible for neglect of insurance of the goods, if he was directed by the depositor to procure the insurance.
>
> SEC. 417. The storehousekeeper must give immediate notice to his customer if any change occurs in the goods which would cause loss in value, or if he neglects such notice he is responsible for the loss.
>
> SEC. 418. The storehouse keeper must allow the owner to inspect the goods, to take samples and necessary action for the preservation of the goods during ordinary business hours.
>
> SEC. 419. The storehouse keeper is not allowed to mix goods of the same class and quality, unless it is expressly consented to by the owner; he must, however, in any case, return goods of the same class and quality.
>
> SEC. 420. The storehouse keeper can claim the contract, or local fee, and compensation for freight and duty, as well as for other expenses bestowed upon the goods, as far as he thought necessary and proper under the circumstances.
>
> All cash expended by the storehouse keeper on the goods must be paid at once; the other charges are to be paid quarterly, or, if the goods are removed, at the time of removal.

If only part of the goods are removed, the charges must be paid, unless the remaining goods are of sufficient quantity to cover the charges of the storehouse keeper.

SEC. 421. The storehouse keeper, it is assumed, holds a mortgage on the goods to the amount of his charges, as long as they are in his possession.

SEC. 422. The storehouse keeper can not force his customer to withdraw his goods before the time specified in the contract, or, if no agreement is made, within three months after storage; if he retains them after the stipulated time (three months), then he can only demand withdrawal of the goods after one month's notice. Only for an important reason can the storehouse keeper demand the withdrawal of the goods before the specified time.

SEC. 424. The storehouse keeper furnishes a receipt (Lagerschein), which may may be transferred by indorsement to another person or firm, the latter having the same right and claim to the goods in storage as if the goods were stored by him.

The above is a general translation of the laws governing stored goods. I can in no place find that the Government takes an active part in the business; it would seem that it is all in private hands and under certain general trade laws, which I have quoted.

THOMAS WILLING PETERS,
Consul.

PLAUEN, *September 3, 1902.*

REPORT FROM STETTIN.

The employment of stored goods as collateral for loans is effected in Stettin in the following manner:

The owner of the merchandise makes personal application at the bank for a loan on certain goods stored in either Government or private warehouses. The bank or the company applied to sends a special inspector to examine the goods as to quantity and quality. He appraises same and makes a report. This being done, the owner makes his statement as to the marks, numbers, quantity, quality, price, and kind of merchandise. If the goods are stored in a Government warehouse, the transferring of the warehouse receipt to the bank is sufficient; if the goods.are stored in a private warehouse, they remain under the private lock and key of the company making the loan. In both instances, the owner of the merchandise executes a transfer. The loaning company then makes an advance up to 50 per cent of its own appraisement. In the case of wine, spirits, and whisky, the customs appraisers' value is used as a basis for making loans. The banks do not risk the appraising of such goods.

The bulk of this business—*i. e.*, the loaning of money on stored goods—is done by the Reichsbank branch office and a few insurance companies.

JOHN E. KEHL,
Consul.

STETTIN, *June 25, 1902.*

REPORT FROM STUTTGART.

There is only one public warehouse here—belonging to the "Stuttgarter Lagerhaus Gesellschaft"—which receives goods on storage and occasionally makes loans thereon; but it is not permitted to issue negotiable storage receipts—so-called "warrants"—on which banks or private individuals may advance money.

EDWARD H. OZMUN,
STUTTGART, *July 25, 1902.* *Consul.*

GREECE.

From what I can learn, there are no warehouses that issue loans on goods in any of the ports of Greece.

The organization in this country most likely to have perfected a system of warehouse loans is the Currant Bank of Greece, which has large depositories in all the principal trade centers of the Peloponnesus and is practically under governmental control. In making inquiries, I have been told that an attempt was made by the Currant Bank a year ago to issue loans upon the currants stored in its warehouses as collateral. The scheme was never perfected, however, principally, it seems, because the banks were not inclined to treat the matter seriously, which is their euphemistic way of saying that confidence in the security was not sufficient to float the loans. No attempt has since been made, and, so far as I have heard, there is no likelihood of a renewal of the attempt this season, although the Currant Bank will carry in stock probably $800,000 worth of currants for the large part of a year.

FRANK W. JACKSON,
PATRAS, *July 15, 1902.* *Consul.*

ITALY.

REPORT FROM MILAN.

The system of using goods stored in the magazines of public institutions as collateral for loans is adopted in Milan with satisfactory results, owing to the measures applied and to the facility with which the warrants issued on the goods can form a base for banking operations. These warehouses, known as general magazines, differ one from the other in some respects, but are all governed by their own by-laws, as well as by the laws of the country.

The largest general magazine in Milan, the "Magazzini Generali Della Lombardia," accepts various kinds of goods, and, by an arrangement with the custom authorities, stores foreign merchandise not cleared, holding it at the disposition of the depositor and reserving the payment of custom duties until goods are withdrawn or become imported into the State, thus saving the duties in case of nonentry. It is, in fact, the English system of free docks adapted to suit Italian methods.

The magazines emit so-called pledge notes (warrants), which certify to the weight, measure, and value of the warehoused goods. This warrant is negotiable for the whole amount, or for that part which it represents, conferring a good title on the holder, and serves as a guaranty to banks for money loans, discounting of bills, and other banking operations. From a banker's point of view, it forms acceptable security, as the value is ascertained by the appraisement of an expert, and only for a limited amount, which, remaining unpaid, can be recovered by a sale of the goods at auction, under the rights conferred on the holder by law.

The method of entering goods is as follows: The depositor, at time of entry of goods, indicates the bank at which he intends to discount the warrant which the magazine furnishes to him. A request is then made by the magazine to the local chamber of commerce for the aid of an expert to make a proper appraisement. An official report is drawn up, showing the estimate in detail, a copy of which is sent to the interested bank. The loan rarely exceeds two-thirds of the value declared by the expert. As before stated, inasmuch as these warrants, when discounted, are on the same footing as bills of exchange, the moment they are protested recourse can be had to a sale by public auction, subject, however, to the enactments in the Italian commercial code, which will hereinafter appear. The magazines sometimes make advances up to a certain amount, which are subject to the same laws which govern loans by banks.

It would appear that for general purposes such operations are not extensive nor of frequent occurrence, the kind of industry which lends itself most to such a system being that of silk in its various branches of trade, such as cocoons, raw silk, and silk derivatives, enabling a merchant to speculate at a favorable moment and at the same time have at least part of his capital mobilized. This is not found so necessary in other trades, and therefore the amounts advanced on ordinary merchandise are insignificant in comparison.

There are several magazines in Milan which receive silk and kindred deposits, the most important being those in connection with the "Banca Commerciale Italiana," that of the "Cassa di Risparmio" (savings bank), and the magazines of the society for the "Stagionatura e l'Assaggio delle Sete ed Affini."

The regulations adopted by these magazines are:

If the goods deposited are to be held in simple custody, an ordinary receipt is made out and the goods can be withdrawn by a written order from the owner against payment of all dues; but if deposits are made to guarantee the so-called subvention, then the certificate of deposit and pledge note pass into the hands of the creditor. The magazines undertake to procure acceptance of the bills by the drawees and to return them to the holders. They advance expenses of freight on all silk sent directly to them, which sum is debited to the deposit at 5 per cent interest. The value of the silk goods, as of the goods deposited in the general magazine, is estimated by an expert, who will calculate at the lowest market value for the day. When the entire deposit is withdrawn, the certificate of deposit and pledge note must be returned to the magazine; but if the withdrawal is partial, the magazines estimate what part of the capital the depositor must pay. This is applicable only in the case where the bank itself warehouses the goods and advances the loan. In cases when the magazines do no banking operations, the rules of law governing the deposit, etc., are those which regulate all loans on goods in public warehouses.

The foregoing is an outline of the rules applied by the majority of the magazines and banks; but, as before observed, each depository has its own specific rules and by-laws which are applicable to the various kinds of goods received. In these regulations, provision is made for the duration of deposit, for default in payments and consequent power of sale, for right of refusal of certain articles if condition be not satisfactory or odor objectionable, for the issuing of samples, as well as for the provision against responsibility for natural shrinkage or unavoidable damage.

All these by-laws and regulations are subordinate to the Italian Commercial Code, by which the whole system is governed.

The following is the law in force at the present time:

ARTICLE 461. The certificate of deposit of goods and merchandise in the general magazines must indicate—

1. The Christian and surname, the circumstances, and address of the depositor.

2. The place of deposit.

3. The nature and quantity of the object deposited, described by the name most known in commerce, and with all other circumstances most likely to establish its identity.

4. If the goods have or have not been cleared at the customs, and if they are or are not insured.

ART. 462. To the certificate of deposit is united the pledge note on which are repeated the above indications.

These "titles" must be detached from the expressly prepared counterfoil register, which the magazines must keep.

ART. 463. The certificate of deposit and the pledge note may be in the name of the depositor or in the name of a third person.

ART. 464. The holder of the certificate of deposit with pledge note annexed has the right to have the deposit divided into parts, at his expense, and for each part to receive a separate certificate, with relative pledge note, in substitution of the summary and sole title, which must be withdrawn and nullified.

ART. 465. The certificates of deposit with the pledge note, united or separate, are transferable by means of indorsement, which should bear the date of the day on which it is made.

The indorsement of both titles effects the transfer of the proprietorship of the goods deposited; the indorsement of the pledge note only confers on the indorsee the right of pledge on the goods, and the indorsement of the simple certificate transfers the proprietorship, except the rights of the creditor who holds the pledge note.

ART. 466. The first indorsement of the pledge note must indicate the amount of credit for which it is made, the amount of interest, and date of falling due; such indications must be also transcribed on the certificate of deposit, and the transcription must be undersigned by the indorsee.

ART. 467. The certificate of deposit and the pledge note may be indorsed in blank. A blank indorsment confers on the holder the rights of an indorsee.

ART. 468. The indorsement of the pledge note, which does not express the amount of credit, engages the whole of the merchandise warehoused in favor of the third holder of good faith, except for the rights of the titulary or third holder of the certificate of deposit who has paid a sum not owed.

ART. 469. Except in case of loss of the certificate of deposit or of the pledge note, or of dispute as to rights of succession and rights in bankruptcy, no pledging, seizure, or any other opposition or claim whatsoever on goods warehoused in the general magazines, shall be permitted; but the indorsement on pledge notes is not affected by the laws of fraudulent preference in bankruptcy, except when it be proved that the indorsee was cognizant of the cessation of payments by the indorser.

ART. 470. The holder of a certificate of deposit separated from the pledge note can withdraw the goods in deposit before the date of the maturity of the bill, on condition that he deposit with the magazine a sum equal to the capital and interest of the debt calculated up to date of maturity.

This sum is paid to the holder of the pledge note on surrender of the note itself.

ART. 471. At the responsibility of the magazine, when treating of homogeneous goods, the holder of a certificate of deposit apart from the pledge note can also take out part of the merchandise, on paying in to the magazine a sum in proportion to the total of the debt guaranteed by the pledge note and to the quantity of the goods withdrawn. The holder of a pledge note not paid at maturity and duly protested as provided by the commercial code can, after seven days, proceed to sell at auction without judicial formality. The indorser who has paid the holder acquires his rights, and may sell eight days after maturity without obligation to proceed under the laws of debtor and creditor.

ART. 472. Sale for nonpayment is not suspended in the case indicated in article 469.

ART. 473. The holder of the pledge note exercises his right also on money derived from insurance of the goods.

Custom rights, tariffs, taxes on sales, and the expenses of warehousing, conservation, and preservation of the goods deposited are given preference over secured creditors.

The residue remains with the magazine, at the disposition of the holder of the certificate of deposit.

ART. 474. The holder of the pledge note can not proceed against the estate of the debtor nor against the indorser if he has not exercised his right on the pledge.

The limit allowed for procedure against indorsers computes from the day of the sale of goods in deposit.

ART. 475. The holder of the pledge note is barred from action against indorsers if, on maturity, proper notice has not been given, or if within fifteen days from date of dishonor he has not applied for order for sale; but right of action is maintained against the original debtor and against the indorsers of the certificate of deposit.

This action is subject to the existing laws on limitations.

ART. 476. Whoever loses a certificate or pledge note may, on giving bond and showing proof of title, obtain an order from the commercial tribunal that a duplicate be furnished him, but only after due publication in proper papers has been made and after a period for opposition shall have expired.

If the pledge note has matured the tribunal may, in the same way, order the sum to be paid. Notice of the order must be served on the warehouseman, as also on the original debtor, who may, however, oppose the order, in which event the whole question shall be disposed of at one and the same hearing. The sentence is executory, notwithstanding opposition or appeal, and it is without bond. The sentence may order the temporary deposit of the amount resulting from such sale.

ART. 477. The sale at public auction of the warehoused goods in the general magazines, whether voluntary or forced, is made without other legal formality than the presence of an authorized public official, or by a notary designated by the chamber of commerce of the district.

ART. 478. The number of the parts, the nature and quantity of the goods for sale, the reserve price, the date and hour, and the conditions of sale must be published at least five days before the sale by means of newspaper notices and by affixing on the doors of the office and stores of the magazine, and on the doors of the stock exchange, the commercial tribunal, the chamber of commerce, and the town hall, notices to that effect.

Such particulars must be previously noted in the registers of the magazine, and two days before the sale the public shall have admittance for inspection of the goods on sale.

ART. 479. The expenses of auction and for the advertising before mentioned shall be paid by the magazine, and the amount shall be reimbursed from the sales in the manner provided by law to that end.

The above extract from the Italian commercial code is more or less metaphrased, in order to keep as near as possible to the Italian text.

WM. JARVIS,
Consul.

MILAN, *September 1, 1902.*

REPORT FROM TURIN.

Turin for many years past has had a system of storage warehouses—"Magazzini Generali Del Municipio Di Torino"—which has proven of marked benefit to merchants and tradesmen. These warehouses, where cocoons, raw silk, wool, wheat, corn, etc., are stored, have been carefully managed, as I am informed, by companies, under the supervision of the municipal authorities, thus enabling those having staple goods in them to secure loans of money, at reasonable interest, upon presentation of proper warrants for such goods.

Goods stored in these warehouses answer as satisfactory security, and on presentation of proper warrants, indicating the character and value of same, loans can readily be secured to the extent of about 75 per cent of their value.

None of the goods in bond in these warehouses can be withdrawn without presenting such warrant, and on such warrant is indicated the character and amount of goods withdrawn.

On presentation of warrants, loans for periods of from three to six months are secured. On perishable goods, loans are made for shorter time. The interest charged for short loans, I am informed, is generally from 1 to 2 per cent higher than the official rate of discount of the National Bank of Italy. When loans are thus secured, the warrants representing the security are turned over to the bank or money lender.

The warehouses here, used for such storage, belong to the city and are leased at auction, for a term of about twelve years, to the highest and most responsible bidders, who are required to make heavy deposits as a guaranty that they will faithfully perform their part of the contract.

The municipality, however, reserves the right of control, so that warrants representing goods stored in such warehouses can be depended upon by capitalists.

I hear but one complaint against this system of storage, namely, that the rents and other charges render the service expensive.

PIETRO CUNEO,
TURIN, *July 16, 1902.* *Consul.*

REPORT FROM VENICE.

The only warehouses in this district that, under proper control, permit values in goods stored to be used as collateral for loans, through the issue of negotiable warehouse receipts, or warrants, as they are called, are, as far as I have been able to ascertain, the bonded warehouses—"magazzini generali." These were established in 1855, to take the place of the private warehouses, which were known as "magazzini fiduciarii." Other Italian cities already had bonded warehouses in operation, but as Venice, up to 1874, was a free port, there had been no need of such an institution.

The earliest laws relating to bonded warehouses are found in a series of acts passed by the Italian Parliament in 1871, regarding the bonded warehouses in Naples, operated by the railway company. These laws have gradually been enforced throughout the Kingdom.

In what is known as the "codice di commercio" (a compilation of laws promulgated by royal decree in 1882, controlling all commercial transactions throughout the Kingdom), the following provisions are found under section 21:

> The certificate of deposit on merchandise in bonded warehouses must show:
>
> 1. The full name, status, and domicile of the depositor.
>
> 2. The quality and quantity of merchandise deposited, and any additional information tending to further establish its identity.

3. The exact place in the warehouse where the goods are stored.

4. Whether or not the merchandise had paid customs duty and been insured.

5. United to the certificate of deposit is the "nota di pegno," or warrant, in which the same information is repeated. These papers are detached from their respective stub registers, which are kept in the warehouse.

The certificate of deposit and the warrant may be issued either in the name of the depositor or of another party.

The holder of a certificate of deposit united to a warrant can, if he so desires, have the goods on deposit divided into different lots, and receive for each lot a separate certificate and warrant in exchange for the original certificate, which must be canceled.

The certificate of deposit and the warrant, either united or separate, are transferable by indorsement. The date on which such transfer is made must be stated. The indorsement of both papers effects a transfer of ownership of the goods deposited, whereas indorsement of the warrant alone confers on the person to whom it is made payable a valid claim on the merchandise, and indorsement of the certificate of deposit alone transfers the ownership, without however prejudicing the claims of the creditor who holds the warrant.

The first indorsement on the warrant must state the amount due to the creditor, the interest, and the date upon which payment is due. The same data must be indorsed upon the certificate of deposit, and signed by the creditor.

Goods stored in a bonded warehouse can not be pledged, seized, or in any way bound except in case of litigation as to ownership, owing to loss of the warrant or certificate of deposit.

The holder of a certificate of deposit, separated from the warrant, can withdraw the goods deposited before the time expires for which the merchandise is being held as collateral, if he deposit at the warehouse the full amount of capital and interest to maturity of said collateral. This deposit is paid over to the holder of the warrant upon its restitution. The holder of a certificate of deposit, detached from the warrant, can also withdraw a part of the merchandise, under the responsibility of the warehouse, provided that the goods are all of the same class, by depositing a sum covering the full amount guaranteed by the warrant, as well as the quantity of merchandise withdrawn.

The proprietor of a warrant which is not paid at maturity, and which is legally protested, can sell the warrant at public auction seven days after protest has been made, without any further judicial formality. The indorser who has paid the owner or satisfied his claims can sell eight days after the warrant falls due. The customs dues, imposts, tax on a sale, charges for deposit and preservation of goods, and any other necessary expenses incurred must be met by the proceeds of the sale. The residue is held by the warehouse at the disposition of the owner of the certificate of deposit.

The possessor of a warrant can not attach the property of the debtor nor take action against the indorser if he has not first made good his claim under the terms of the warrant. Any claims against the indorsers must be made before the sale of the merchandise on deposit has been effected. The owner of a warrant loses the right of taking action against the indorsers if, when the debt falls due, he does not protest as to nonpayment, or, after having protested, he does not, within a space of fifteen days, demand the sale of the goods. He has, however, the right to sue the original debtor or the indorsers of the certificate of deposit.

Anyone losing a certificate of deposit or warrant can, upon an order from the tribunal, be furnished with a duplicate of the lost document, a proper bond having been filed and all legal requirements complied with. If the warrant has fallen due during the period in which the original document was lost, the tribunal can order payment of the debt.

The sale, either forced or voluntary, by public auction of merchandise deposited in a bonded warehouse can be effected without any judicial formality by means of a public official authorized to act in that capacity and a notary public appointed by the chamber of commerce. The number of lots, the quantity and quality of the goods to be sold, conditions of sale, auction price, and the day and hour that the auction is to take place, must be made public five days beforehand by advertisement in the journal of official notices, by affixing a notice on the door of the deposit office of the warehouse, as well as at the stock exchange, the tribunal, chamber of commerce, and municipality. Two days previous to the sale, the public are admitted to examine and verify the goods on sale. All expenses are borne by the warehouse, which has the right to levy on the proceeds of the sale whatever claims it may have, in accordance with restrictions fixed by special laws.

The storage and warehouse business, as it is carried on in the principal business centers of the United States, can scarcely be said to exist in this consular district. There are a few of the important banking concerns and shipping and commission houses that store goods upon which loans can be made, but I can find no regularly organized company of that sort under legal control.

H. A. JOHNSON,
Consul.

VENICE, *October 28, 1902.*

NETHERLANDS.

REPORT FROM AMSTERDAM.

During the reign of the counts of Holland, it had already become necessary to establish a weigh-house, in order to guarantee to merchants correct weighing by means of measures controlled by the city authorities. It is supposed that as early as the year 1275, such a weigh-house existed on the dam at Amsterdam. Later, the privilege of the weigh-house was transferred to the city. During the seventeenth century, the period during which the East India Company and the West India Company flourished so extraordinarily, every merchant, before delivering goods, was compelled to have them weighed in the city weigh-house (Stadswaag). Merchants brought their wares to the city and employed weigh-house carriers (waagdragers) to place them upon the scales of the weigh-house and to deliver them on board ship. These waagdragers formed corporations called "veems," under the direction of four or five chiefs and four trustees, chosen from among the leading merchants. These directors employed laborers to perform the work. When the city abolished the municipal weigh-houses, the waagdragers took a city oath and were then called "sworn weighers" and workers for the trade. Their work consisted of receiving goods from on board ship, weighing them, and either warehousing or delivering them.

For a long period—perhaps forty or fifty years—the veems have issued "cedullen" (warrants) to bearer for the goods stored by them in their warehouses. These warrants are accepted by the Netherlands Bank and also by private bankers and banking institutions as collateral for loans.

In making loans upon merchandise, the Netherlands Bank requires the following:

1. The borrower must be well known to the bank.
2. An application for a loan, accompanied by an estimate by a broker accepted by the bank, and a statement of the value must be furnished.
3. Such application must be approved by the direction of the bank.
4. A contract deed of the loan must be made, whereby the merchandise is transferred to the Netherlands Bank.

Loans may be made up to 65 per cent of the value on articles that are not very largely dealt in; up to 70 per cent, on most articles of merchandise; on sugar and cotton, 75 per cent; and on tin, 80 per cent.

The warrants of only such veems, or warehouses, as have a guaranty deposit with the bank are accepted by the Netherlands Bank as collateral for loans.

The warrants of the Dutch Trading Company and of the municipal bonded warehouse are accepted by the bank bona fide. The average amount loaned on merchandise in this way by the Netherlands Bank during the last three years has been about 7,000,000 florins ($2,814,000).

In consequence of the increase of trade and of the extension of warehouses, the veems of late years have been transformed into stock companies, each having a capital of from 1,000,000 florins ($402,000) to 3,000,000 florins ($1,206,000).

F. D. Hill,
Consul.

Amsterdam, *July 10, 1902.*

REPORT FROM ROTTERDAM.

One of the principal warehouse corporations at Rotterdam informs me that warrants are issued in the Netherlands against goods stored in the warehouses. On these warrants, the owner of the goods can raise money at the Bank of the Netherlands or any other banking institution.

In advancing a certain percentage of the value of the goods on the warrants, bankers depend largely on the standing of the establishment which issues them, but they can, if they desire to do so, control the value of the warrants by inspecting the goods indicated thereon (every warrant represents a definite parcel, to which the number of the warrant is attached) in person or by representative at the warehouse.

The State or city government does not control the warehouse corporations or the warehouses, and in the opinion of the warehousemen here, the necessity of such control has never been felt, as goods can always be inspected by parties interested.

Before advancing money on warrants, bankers generally demand a valuation, by a sworn broker, of the goods represented by the warrants. The appraising of the goods is generally done by inspecting samples taken therefrom.

The warrants generally also cover fire insurance, the risk being taken by the warehouse companies and the premium calculated in the rent paid for the goods stored.

S. Listoe,
Consul-General.

Rotterdam, *August 11, 1902.*

RUSSIA.

GENERAL REPORT.

While the Russian Government or the authorities of the city of St. Petersburg do not exercise a direct supervision or control over warehouses and the business connected therewith, there are certain rules and regulations established by the Government and embodied in the "general commercial code of Russia" which must be strictly adhered to by warehousemen, transportation companies, and all persons engaged or desiring to engage in this class of business.

These regulations prescribe that a warehouseman or any other person can not start a business of this character without first obtaining special permission from the Minister of Finance; the rules further determine the manner in which loans can be granted on stored goods, fix the amount of such loans in proportion to the value of the goods, and provide for the rate of interest and the term of a loan contract—in fact, cover all points that may arise in connnection with such transactions. Loans are generally made by banking institutions, but also by warehousemen and private parties. I was able to secure the by-laws of the two largest warehouses in this country. These by-laws, which have been approved by the Minister of Finance, are based on the commercial code above referred to. The following is a condensed translation, and, I believe, gives a clear idea of how the business is done:

The company has the right to accept goods for storage and for this purpose to establish warehouses in different parts of the Russian Empire.

The warehouses and the issuing of warehouse receipts or pawn certificates are subject to the general regulations contained in the commercial code of Russia, sections 709 to 762.

The company has the right to grant loans (1) on goods which have been taken charge of by the company for transportation, storage, or on commission, and (2) on warehouse receipts issued by the company.

The advance or amount loaned on goods or on warehouse receipts must not exceed 75 per cent of the estimated value determined by a sworn appraiser. The rate of interest is fixed by the administration of the company, with the approval of the Minister of Finance, and must be published from time to time. The rate of interest can not be changed before the expiration of the loan contract it refers to.

The company has the right, under instructions and for the account of its customers, to mortgage or pawn the warehouse receipts which it issues, with banking institutions or with private persons. Goods on which loans are granted must absolutely be insured for a sum which must exceed at least by 10 per cent the amount of money advanced and for a period exceeding by one month the expiration of the loan contract. The insurance policies must be kept in the custody of the company.

When an advance of money is made on goods stored with the company, the owner of the goods is provided with a receipt on which all the conditions under which the loan is made are fully set forth, subject to the approval of the Minister of Finance. The loan contracts are usually made for such period of time as the goods remain in the custody of the company, if this period is fixed; if, however, the term of storage is not limited, the loan contract can not exceed six months. If the borrower fails to return the amount advanced to him on goods stored with the company at the date agreed upon, he is allowed eight days' grace, but must pay a fine of one-half of 1 per cent for the delay.

The company has the right to sell stored goods at auction (1) if the owner does not claim his goods or is unwilling to accept them, and (2) if freight charges or the sum loaned on such goods are not paid on the date agreed upon. In the latter case, the company charges the full interest stipulated in the loan contract for a period from the date payment was due to the date it has recovered damages, counting each fraction of fifteen days as a full half month.

The sale of goods, in cases mentioned above, is held by official auctioneers whenever practicable, and due notification thereof must be given to the local police authorities, who must see that the matter is conducted in accordance with the laws governing public sales. The proposed auction must be published in the local papers three times before the sale can be started, the first notice to be published after the expiration of the time of grace and the last notice at least six weeks before date of sale. The advertisement of sale must specify kind of goods, place, date, and hour of auction, and also time and place for previous inspection of goods. Notices of sale must be posted at the entrance of the city hall, the municipal buildings, at the offices or agencies of the company, and at the warehouse in which the goods in question are stored.

Goods which have begun to spoil, if unclaimed or refused by owner, can be sold through the mediation of the local police authorities without regard to any certain contract that may exist between the parties in interest. However, as soon as it is discovered that the goods are spoiling, this must be duly recorded and immediate notice thereof sent to the owner of the goods, provided his address be known to the company.

The sum realized from such sale is used to cover the amount advanced on same, after deducting necessary expenses incurred by storage and the auction, and in preference to all other claims standing against the owner of the goods, even if the latter is in a state of bankruptcy. The balance, if any, is invested at interest in a banking institution for the benefit of the owner of the goods, who can claim this sum within ten years from date of sale of the goods. Goods which have been delivered to the company as a security can not serve to satisfy private or fiscal claims before the company has been paid in full for the amount advanced on said goods, and also for expenses for freight, charges, etc.

If the highest price offered at the first auction is not sufficient to cover the claims of the company, a second public sale can be held, which must, however, take place within one month from the date of the first, and must be properly advertised. If at the second auction the goods can not be sold for such price as will satisfy the claims of the company and pay the costs of the public sale, the company keeps the goods and closes all accounts with the owner of the goods.

The class of goods on which loans are principally granted is: All kinds of cereals, naphtha, hides, tobacco, timber, and salted fish. The transactions are entirely of a private character, based on contracts between the parties in interest, and I can not learn that the methods adopted here offer any particular security beyond the faith of the banker or the party making the loan in the individual warehouseman.

HERNANDO DE SOTO,
Vice and Deputy Consul-General.

ST. PETERSBURG, *August 7, 1902.*

REPORT FROM BATUM.

As far as I have been able to ascertain, there is no governmental supervision of warehouses here which would be a guaranty to lenders of money upon goods in storage.

There are four banks in this place, one a branch of the Imperial Bank, and all make loans upon goods in storage, generally upon the principle that if the owners of warehouses are sufficiently responsible for goods to be intrusted to them, they are also good enough security for the property when mortgaged to the banks. Some of these banks, however, have warehouses of their own; but much money is advanced upon steamship bills of lading, the goods covered being always in the custody of the customs authorities when landed and remaining in the custom-house until duty is paid and the goods are released by holders of mortgages on them.

Another sort of loan very common here is upon petroleum products in tanks; but such loans are always secured by a temporary transfer of the tank and contents, of which the public is notified by a notice attached to the tank to the effect that tank and contents are mortgaged to whichever bank has made the advance.

It is my impression that the business of lending money upon goods in storage is conducted here in just about the same manner as such business was done in the United States when I was engaged in business there; but that is nearly twenty years ago, and changes in methods have probably been made in that time.

JAMES C. CHAMBERS,
Consul.

BATUM, *July 3, 1902.*

SPAIN.

REPORT FROM VALENCIA.

Nonperishable goods in warehouse are very generally utilized in this district as security for loans. So much depends, however, upon the character and commercial antecedents of the merchants applying for such advances that cases are dealt with on their individual merits, and no special custom or uniformity of procedure obtains here. The documents giving the banker a lien on the goods are nearly always of a private character, and are not negotiable or transferable. Where confidence in the merchant is wanting, the banker safeguards himself either by removing the goods to warehouses under his own control, or, if they are left in the merchant's warehouse, by exacting from the latter a document, signed before a notary, practically ceding the legal ownership of the goods to the banker and worded in such a way as to bring the merchant within the meshes of the criminal law, subjecting him to immediate arrest should he tamper with the goods or withdraw any portion of them without the knowledge and written consent of the banker, to whom he refunds advance in proportion to the quantity of goods withdrawn.

R. M. Bartleman,
Consul.

Valencia, *June 28, 1902.*

SWEDEN.

REPORT FROM GOTHENBURG.

I am informed that in this matter Gothenburg is far behind other cities, and is following very antiquated methods.

Most articles imported into this country are subject to duty. If the importer or owner of the goods should prefer not to pay the duty on arrival, the goods can be stored in bonded warehouses. These bonded warehouses are ordinary warehouses or cellars scattered all over the city, rented by the importers, and become bonded when the customs hold the key to the same.

If the owner of the goods thus bonded wants to make these or part thereof security for a loan, he transfers the goods, or as much thereof as is necessary, to the customs, gets a written acknowledgment thereof, and, presenting this to his banker, he gets a loan generally to the extent of two-thirds of the value of the goods, the value being fixed according to the official market price quoted on the day of the loan.

Should the value of the goods drop, the lender may be requested to pay the difference between the price fixed and the price of the day.

For obtaining a loan on goods not under the control of the customs, the banker demands, apart from the ordinary written security, to be the holder of the key to the warehouse and that the rental contract be transferred to him.

There is not, to my knowledge, any supervision of warehouses, either corporate or national, except that exercised by the banks under the conditions mentioned above.

ROBERT S. S. BERGH,
Consul.

GOTHENBURG, *September 17, 1902.*

REPORT FROM STOCKHOLM.

There is only one warehouse in Stockholm, viz, "Stockholm's Magasins Aktiebolag," that loans money on certain goods—coffee, sugar, flour, pork, and, as a rule, such articles as are easily marketable. It loans up to 65 per cent of the wholesale price of the goods. On other articles, such as agricultural implements, cognac, arrack, and spirits of all kinds, it loans 50 per cent of the wholesale price.

The interest charged is one-half of 1 per cent higher than the regular bank interest. This is usually 5 per cent, and any rate above that is considered usurious. In addition, one-tenth of 1 per cent is charged for each month as commission.

EDWARD L. ADAMS,
Consul-General.

STOCKHOLM, *August 20, 1902.*

NORWAY.

The Norwegian custom-house officials do not provide such facilities for the storage of imported merchandise that the banks are willing to lend money on this merchandise as collateral. The custom-house at Christiania, and I believe the custom-houses at other large towns in the country, have made arrangements, however, by which owners and importers of certain staple merchandise, such as groceries, provisions, oils, cotton, etc., may remove the goods from the custom-house to certain private warehouses, accepted as responsible, after having produced the bills of lading. The import duty need not be paid at the custom-house before removal, the warehouse people becoming responsible for the money, which must be paid within one year, and in shorter time if the storage and insurance are likely to exceed the value of the goods.

The owner then makes application to the warehouse people for accommodation, and for this purpose uses a form in which are stated the agreements as to rate of storage, insurance, etc. When the goods have been received at the warehouse, a nontransferable warehouse certificate is issued, giving a short description of the goods, number of parcels, marks, and weight. If the owner wants to borrow money on the goods, he may do so by applying to a bank and producing the warehouse certificate. Before lending the money, the bank will cause the goods offered as collateral to be examined and their value ascertained by one or more members of the Christiania Commercial Appraising Board. The invoices are examined at the same time. Thereafter, banks are prepared to lend from 50 to 90 per cent of the value of the goods, the latter serving as collateral and the warehouse people becoming responsible to the bank for safe storage of the merchandise until the loan is paid. Portions of the goods may be withdrawn from time to time, on payment of the proportionate amounts of money to the several creditors.

HENRY BORDEWICH,
CHRISTIANIA, *July 12, 1902.* *Consul-General.*

SWITZERLAND.

REPORT FROM BERNE.

In Switzerland, the negotiable warehouse receipt rests entirely upon the faith placed in the individual warehouseman, who certifies to the quantity, but not to the quality, of the goods stored with him. There is no supervision of warehouses, either cantonal or federal. It is a private business transaction, subject to the Swiss law of obligation, which is severe upon false representations.

Since the Federal Government has commenced to take over and assume control of the main railroads, the warehouse receipts are the same in their tenor as when the railroads were individual properties.

A. L. FRANKENTHAL,
BERNE, *July 17, 1902.* *Consul.*

REPORT FROM GENEVA.

There exists in Geneva an association called the "Society for the Running of the Warehouses of the State of Geneva"—organized in 1888—under the control of State authorities and federal customhouse. This association puts at the disposition of Geneva tradespeople two bonded warehouses where goods can be stored on their arrival from foreign countries and left there without paying customs duties until taken out. The semiofficial character of the association authorizes the managers to act with security in issuing "warrants," *i. e.*, loans against goods and wares deposited with them—such as wheat, wine, colonial products, etc.—of an easy sale and disposition.

All applications for warrants are submitted to a commission of three directors, who determine the conditions of the warrant in each case and have the right to refuse its issuance without declaring the reason.

Warrants are not issued for amounts under 500 francs ($96.50) and can in no case exceed 70 per cent—this is rarely reached—of the actual market value of the stored goods.

In case of an unforeseen fall in prices of the goods, the association has the right, if the guaranty is deemed insufficient, to exact, before the date of expiration of warrant, a supplemental provision of goods or the payment of the difference. If neither of these two things be done, the association has the right to sell the goods at once.

The "receipt of warrant" may be indorsed, but, to be effective, must also be countersigned by the director. The said receipt must be accompanied by the certificate of storage for the total amount of the goods.

Warrants are issued for a period of thirty, sixty, or ninety days at the utmost, but a renewal may be granted—but not for the full sum of the original amount—and another warrant issued.

The application for renewal of warrants must reach the directors within eight days of the date of expiration, when it is examined by the special commission of three directors.

The goods stored in guaranty may be taken away in whole or in part, provided that a proportional payment be effected. An interest of 2 per cent is given to sums thus deposited ten days at least before date of expiration, if the sum is not less than 500 francs ($96.50).

The conditions for issuing warrants are subject to the decisions of the special commission, who have samples of goods proposed as guaranty examined and their value estimated.

The discount to the warrant is generally arrived at in the following manner: Rate of bank discount plus, generally, 1 or 1½ per cent and a commission varying from one-fourth to one-eighth of 1 per cent, but nearly in all cases one-eighth of 1 per cent.

In 1901, the society issued 17 warrants for a total of 126,700 francs ($24,453.10), leaving a profit of 930 francs ($179.79). This year (1902) is anticipated to leave 1901 far behind.

Since 1888, the society has suffered a loss of only about 2,000 francs ($386).

From time to time, also, all shipping agents (expéditeurs commissionnaires) of Geneva lend money to travelers and residents against goods stored with them, usually trunks, bags, furniture, and food stuffs, on an interest of generally 5 per cent plus 1 franc (19.3 cents) per package for monthly storage. This, however, is not done extensively and may be roughly estimated at about 15,000 francs ($2,895) per year.

HORACE LEE WASHINGTON,
GENEVA, *July 25, 1902.* *Consul.*

REPORT FROM LUCERNE.

All goods taken by the warehouses of Switzerland for storage are insured against fire as soon as they come into the possession of the warehouse, either when on the rails or in their magazines. Immediately upon receipt of the goods, the owner is given a notice, as follows:

NOTICE OF ARRIVAL.

WAREHOUSES OF CENTRAL SWITZERLAND,
Aarau and Olten, ———, *190—.*

(Address) ——— ———.

We have to inform you that we have received to-day a shipment from ———, containing the goods stated hereunder, addressed to you.

We receive them and keep them at your disposal, and we request you to refund us the amount of ——— francs, according to the following account "valuta" to-day. For prolonged storage, we charge for the second and following months ——— centimes for 100 kilograms. As we insure the goods against fire, you will have to inform us of their insurance value; and in order to avoid errors, kindly state value for every piece separately, giving numbers thereof according to the notification you have received from the shipper. All business between you and the warehouses is transacted according to our regulations and tariff, which will be sent to you on demand, free of charge.

Yours, respectfully, ——— ———.

Warehouse number.	Mark.	Number.	Packing.	Description.	Weight.	Expense account.	Francs.	Centimes.
....	....	....	....	....	....	A. Expenses according to freight bill..............	....	....
....	....	....	....	....	....	Freight and expenses..............................	....	....
....	....	....	....	....	....	Reimbursement	....	....
....	....	....	....	....	....	Commission	....	....
....	....	....	....	....	....	Federal duty..	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	B. Expenses of the warehouse.........................	....	....
....	....	....	....	....	....	Reception and storage, first month............	....	....
....	....	....	....	....	....	Insurance	....	....
....	....	....	....	....	....	Sampling..	....	....
....	....	....	....	....	....	Unloading, reloading, etc............................	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....

This notice guarantees all rights of ownership.

The rules of the Lagerhäuser der Centralschweiz governing loans made by the warehouse are the following:

CONDITIONS FOR LOANS.

1. The warehouses make cash advances on current goods. Under certain circumstances, loans are also made on railway receipts.

2. As a rule, applications for loans are to be made in writing.

3. The value of the mortgaged goods is ascertained by experts at the expense of the receiver of the loan.

4. The amount of the loan is two-thirds or three-fourths of the appraised value.

5. On goods the storage of which is connected with any danger, an advance of not more than two-thirds of their value can be made, but on such goods as are liable to deteriorate or as are difficult to sell, no loans can be given.

6. Advances of less than 500 francs ($96.50) can not be made.

7. Advances are always made for a term of three months, and the receiver has to accept a bill of exchange and to sign a mortgage deed according to our form.

8. The bill of exchange is payable at the cash office of the warehouses, and will not be circulated.

Application for prolongation has to be made five days previous to maturity, and the receiver of the loan has to cover the storage expenses due so far.

9. From the loan are deducted—

Interest and provision for three months.

Appraisers' expenses and all other expenses encumbering the goods.

10. The rate of interest is fixed according to the general position of the money market and the provision according to the amount of the loan. For large amounts, special terms are made.

11. The owner of the goods is allowed to withdraw his goods partially or wholly against proportional reimbursement of the advanced amount; all payments are credited in account current, and interest is paid thereon.

The administration of the warehouses reserves the right to cancel or alter the foregoing regulations at any time.

AARAU, *October 4, 1883.*

The form used for the purpose of making a loan I give hereunder:

MORTGAGE DEED.

WAREHOUSES OF CENTRAL SWITZERLAND.
AARAU AND OLTEN.

I (we), ———, the undersigned, hereby mortgage to the Warehouses of Central Switzerland, as security for the amounts which I (we) owe them at present or will owe them in the future, all goods which I (we) have stored in their warehouses or will store in the same.

All packing, boxes, barrels, etc., and accessories of the goods are to be included in the mortgage.

Should the debtor fail to render due payments, the creditor is allowed fourteen days, after unsuccessful warning, to sell the goods, wholly or partially, for the debtor's account.

The courts of Aarau and Olten are competent for the settlement of all disputes in regard to this mortgage or to the claims of any parties in connection with the same.

Should the warehouses be obliged to take legal proceedings, they will be entitled to collect all expenses caused by such proceedings and an extra fee of 5 per cent of the amount sued for as a compensation for their trouble.

They are also entitled to the same compensation if the settlement of their claims takes place through bankruptcy proceedings, through liquidation by the courts, or through attachment.

Date: ———, *190—*.

If the depositor wishes to negotiate a loan through a third party on the goods held by the warehouse, the third party must ascertain the absolute right of disposal of the owner. In such cases, it frequently happens that the goods pledged are transferred to the name of the party making the loan, and a "bill of transfer" conveys to the mortgagee all rights of disposal.

The warehouses advance all freight and duty without a mortgage deed, if the value of the goods offers a sufficient security, and in such cases are protected from loss by the Swiss civil laws giving them the right of detention.

H. H. MORGAN,
Consul.

LUCERNE, *July 28, 1902.*

TURKEY.

REPORT FROM CONSTANTINOPLE.

Public warehouses in the sense referred to in the Department's circular do not exist in this city.

Both the Imperial Ottoman Bank and the Credit Lyonnais advance money on goods stored in their own warehouses, which are entirely under their own control, and the bulk of the business is in their hands.

The rate of interest charged for loans is from 7 to 9 per cent per annum, payable quarterly. Upon interest remaining unpaid when due, compound interest at 9 per cent accrues. There are in addition dues to cover warehousing and insurance, which have to be paid by the depositor. Up to 70 per cent of the value of the merchandise is advanced, but the value is usually calculated at a slightly lower figure than the actual market quotation. Should the value of the stored goods fall below the figure upon which the bank originally made the advance, the owner is called upon to deposit with the bank a sum of money sufficient to cover the difference between the original and depreciated value of the merchandise; otherwise the banks claim the right to sell.

Besides the two banks mentioned, there are a few private firms which advance money on much the same terms, but the amount of business done by them is very small.

WM. SMITH-LYTE,
Vice and Deputy Consul-General.

CONSTANTINOPLE, *October 16, 1902.*

UNITED KINGDOM.

REPORT FROM BRADFORD.

It is an acknowledged fact that when business men with limited capital have to carry stocks for long or short periods, without being able to obtain reasonable advances thereon, they are often unable to improve opportunities which may present themselves, whereby enterprise is crippled and legitimate trade development hindered. To overcome this difficulty, there are in existence in England certain methods, perfected by long experience, which have proved most advantageous to the commercial community. Merchants here assert that if they could not use stocks as collateral for loans, they would be so handicapped that circumstances would compel them to cut down trade, in some cases to a very large extent.

Here, as in every other country, the personal element enters largely into business transactions between commercial men and their bankers. Though a matter outside the question at issue, it must not be forgotten that absolute confidence is necessary between bankers and their business clients, if full advantage is to be taken by the latter of any goods they may have in stores or bonded warehouses. It is no unusual thing for business houses to require temporary assistance in carrying heavy stocks, and while it is the common practice for the bank to obtain as much security as possible, the knowledge of the fact that the firm in question is one of good standing, and that the heads of the house are men of integrity and sound business judgment, helps materially in inducing banking establishments to render this aid.

The very extensive foreign trade which Great Britain has built up, both in imports and exports, has made it absolutely imperative that the Government should grant all reasonable facilities for giving security both to business houses and to bankers in the conduct of this huge business.

METHOD OF DOING BUSINESS.

Especially in the import trade is this question of assistance of importance. A vessel arrives having on board, say, 1,000 bales of wool for a Bradford house. This represents a fairly large sum of money, and if the importer has no immediate use for it, he allows the wool to remain at the port of arrival—London, Liverpool, or Hull, as the case may be. This wool is taken and stored in large warehouses owned by the corporation, the steamship company, railroad company, or the Government. In the case of imported wool, it is the practice for the Bradford merchant to have samples taken from the bulk sent to him, from which he is enabled to sell the wool thus stored, and as the lot is sold the bales are forwarded, so many of this quality and mark, so many of the other, just as the consumer sees fit to take; and it is no uncommon thing for Bradford bankers to render valuable assistance in this connection to their clients. A Bradford house has a representative in Australia buying wool, a Bradford bank agreeing to be responsible to a bank in Australia for, say, $1,000,000, the bills of lading, insurance policy, and invoice coming through them. A copy only of the invoice is sent direct from Australia to the Bradford firm, which, on the wool arriving in this country, takes it out of the banker's hands, handing over drafts payable at thirty or sixty days, as agreed upon. The wool is stored in warehouses at the railroad stations, or more frequently at the docks at the port of arrival, over which the banker has complete control, this wool being forwarded to the client only when the banker is assured of the stability of the firm.

DOCK WARRANTS.

The safest and most extensive method of doing business, whereby large values in goods stored can be used as collateral for loans, is by what is known as "dock warrants."

Goods of a valuable nature are largely imported into this country. These may be stored in customs warehouses under the direct supervision of civil-service officers attached to the customs. When the goods are taken into the warehouses, every particular is entered respecting them and receipts under the signature of these officials are given, which are styled "dock warrants." These warrants are negotiable by importers or by their holders in the same way as bills of exchange or checks. The property detailed on the warrants remains in the hands of the holder of the same, and will be given up by the customs officials only on the production of the warrant and payment of the duty prescribed, if any, to the Government.

As already pointed out, the property passes with the warrant when properly signed, and therefore these warrants are used as collateral security with bankers. The banker can, without further authority, exercise the right to dispose of the goods by means of this warrant, but it is seldom done unless the owner falls into trouble or some other unforeseen circumstance arises which compels their sale by the banker. Of course, no banking establishment will advance money on goods to their full value, reserving a safe balance in order to protect itself. Seeing that this is the crux of the whole question, I have obtained an expert opinion on this one branch of the business, supported, sanctioned, and adopted by the British Government, and in which the bankers have implicit faith as a safe method by which the large values in the goods stored can be used as collateral for loans. The gentleman I consulted says:

> When the goods are warehoused, the dock company gives a receipt for them to the owner, or, if desired, it will give him a dock warrant. This is a certificate containing the same particulars as the landing account, but it is headed "warrant," and states that the goods are deliverable to the owner or his assigns by indorsement thereon. A dock warrant is a negotiable instrument in the same sense as a bill of lading, inasmuch as the goods it represents are transferred with the document, when it is properly indorsed. The holder of a dock warrant may, therefore, deposit it against a loan, or he may sell it, and thus sell the goods which it represents. When once a warrant is issued, the dock company will only deliver the goods in exchange for the warrant.

From the above, the simplicity and yet the extreme usefulness of such a measure will be seen. If the owner of goods does not need to remove all the packages covered by the dock warrant, he can obtain one or more, as desired; in fact, every facility is afforded both by bankers and customs officials in respect to their storage and sale. The whole routine of warehousing goods which can be used as collateral, though simple, is effective, and merchant houses are thereby enabled to do an extensive trade which they would not be able to transact if these facilities were not given to them. There are in connection with these warehouses properly qualified officials, over whom strict supervision is exercised, as over everything in the shape of entries for warehousing, landing accounts, dock warrants, brokers' sales accounts, merchants' account sales for goods "on consignment," including delivery orders, etc. Everything is done to facilitate expedition along with security, and, while English bankers are careful in their dealings, yet when business firms are sound, banking establishments are never adverse to giving them reasonable assistance.

The same principle applies when advances on stocks are required in inland cities. The goods are warehoused or deposited at the railroad stations, and the firm to which the advance is made transfers the ownership to the bank which is making the accommodation, and it is only on the order of the bank that the goods can be released.

ERASTUS S. DAY,
Consul.

BRADFORD, *July 23, 1902.*

REPORT FROM HULL.

The feasibility of making merchandise stored in warehouses available as collateral for loans has long been recognized in Great Britain. It is a practice that prevails in every large city where the warehouse system has become operative, and is not only a very simple, but a very popular method of raising money in certain contingencies.

When merchandise has been deposited in a warehouse, the latter issues a receipt in the form of a warrant, and this warrant becomes negotiable at the bank. The banks, it must be understood, do not accept them in every instance. The warehouse people who issue them must be in good standing and thoroughly responsible in a financial sense.

In the negotiations, the banks invariably insist on a good margin, so far as the value of the merchandise is concerned, as a precaution against loss, either through fluctuations in market values or depreciation by forced sale or otherwise. The average rate of interest in all these cases is 5 per cent per annum. When the conditions of the loan have been complied with, the bank, as holder of the warrant, becomes the de facto owner of the merchandise described therein, and so notifies the warehouse proprietors. Neither the terms nor conditions of the loan are made known outside the bank. In case of default on the part of the borrower, the merchandise is delivered to the bank and put up at auction in the ordinary way. In this connection, the following details relating to the rates and charges agreed upon by the warehouse keepers here may be of interest to similar associations in the United States:

WAREHOUSE CHARGES IN HULL.

The standard weight of grain and seed per quarter upon which charges are levied are:

	Pounds.
Wheat, wheat screenings, maize, rye, pease, beans, dari, and tares	480
Barley and buckwheat	448
Millet seed, linseed, rape seed, niger seed, cockle seed, and cockle-seed screenings	424
Oats	336

A last of grain or seed consists of 10 quarters.

The charges on cotton seed are quoted per ton of 20 cwt.—that is to say, 2,240 pounds English standard.

CLASSIFICATION OF WAREHOUSES.

The several warehouses are divided into three groups: Those of the Northeastern Railway Company and the Hull, Barnsley, and West Riding Junction Railway and Dock Company being group No. 1; those of the harbor-side warehouses below North Bridge being grouped No. 2; and those above that bridge, No. 3.

Grain and seed ex ship.—Groups Nos. 1, 2, and 3: Landing, including lighterage or truckage ex ship, wharfage, housing, weighing twice, and delivering from warehouse—including bagging, tying, and twine when required—consolidated rate, 5s. 5d. ($1.30) per last.

Allowances: To merchants who weigh and deliver grain or seed in bulk overside at their own cost, 10d. (20 cents) per last, and deliver overside without weighing, 5d. (10 cents) per last; to merchants who deliver grain or seed in original bags (except Indian) overside into craft at their own cost, 4d. (8 cents) per last, and similarly weigh and deliver overside, 7d. (14 cents) per last; to merchants who weigh and deliver Indian grain or seed overside into craft at their own cost, 11d. (22 cents) per last; to merchants who employ sworn weighers to weigh, when the associated warehouse keepers are working grain or seed overside, an allowance of 1½d. (3 cents) per last.

Rent per week: Group No. 1, 2½d. (5 cents) per last; group No. 2, 5 per cent less than No. 1; group No. 3, 12½ per cent less than No. 1.

Grain and seed ex lighter.—Groups Nos. 1, 2, and 3—landing, wharfage, housing, weighing, and delivering, including bagging, tying, and twine when required—consolidated rate, 3s. 9d. (90 cents) per last.

Rent per week: Group No. 1, 2½d. (5 cents) per last; group No. 2, 5 per cent less than No. 1; group No, 3, 12½ per cent less than No. 1.

Grain and seed.—Grain and seed, in parcels of not less than 250 quarters, for immediate delivery on the following conditions: Groups Nos. 1, 2, and 3—delivering ex ship to quay, shed, warehouse, or lighter, weighing twice and delivering, including bagging, tying, and twine, and for steamers ten running days, and for sailing vessels six running days, free of rent after completion of continuous discharge of the parcel or cargo, as the case may be—4s. 2d. ($1) per last. This rate applies whether the whole or part of the services are performed by the warehouse keepers, and merchants must give written instructions before or at the commencement of the discharge from ship. At the expiration of the foregoing periods, any grain or seed remaining in warehouse will be subject to a charge of 6s. 5d. ($1.56) per last, instead of 4s. 2d. ($1), and rent will be charged as if originally stored under the No. 1 rate. Orders for delivery will only be executed in regular turn with customary dispatch; any extra expense incurred to enable delivery to be given within the time allowed to be paid by the merchant. If the discharge of the cargo be suspended for more than forty-eight hours for want of ballast or placing the ship in dry dock, the grain or seed then delivered shall be considered as the whole of the parcel and the delivery completed, a fresh order being required for dealing with the residue.

Cotton seed ex ship.—Group No. 1—landing ex ship, including lighterage, wharfage, housing, twice weighing, and delivering, including bagging, tying, and twine, if required—Egyptian cotton seed, 3s. 9d. (90 cents) per ton; all other kinds of cotton seed, 4s. 2d. ($1) per ton; rent per week, 1½d. (3 cents) per ton. Groups Nos. 2 and 3—working overside, lighterage ex ship, housing, twice weighing, and delivering, including bagging, tying, and twine, if required—Egyptian cotton seed, 3s. 11d. (95 cents) per ton; all other kinds of cotton seed, 4s. 4d. ($1.04) per ton. Rent per week: Group No. 2, 10 per cent less than No. 1; group No. 3, 15 per cent less than No. 1.

Allowances: To merchants who weigh and deliver cotton seed into craft overside at their own cost, 2d. (4 cents) per ton; to merchants who employ sworn weighers to weigh when the associated warehouse keepers are working overside, 1d. (2 cents) per ton.

Cotton seed ex lighter.—Group No. 1—landing, wharfage, housing, once weighing, and delivering, including bagging, tying, and twine if required—Egyptian cotton seed, 3s. 4d. (81 cents) per ton; all other kinds of cotton seed, 3s. 10d. (93 cents) per ton; rent per week, 1½d. (3 cents) per ton.

Groups Nos. 2 and 3—landing, housing, once weighing, and delivering, including bagging, tying, and twine if required—Egyptian cotton seed, 2s. 9d. (66 cents) per ton; all other kinds of cotton seed, 3s. 4d. (81 cents) per ton. Rent per week: Group No. 2, 10 per cent less than No. 1; group No. 3, 15 per cent less than No. 1; charges for additional services.

Making up grain or seed bags.—Cental bags, 4s. 2d. ($1) per 1,000; larger bags, 6s. ($1.46) per 1,000.

Empty bags in bundles.—Weighing and delivering ex ship, 2s. 6d. (60 cents) per ton; wharfage, landing, housing, weighing, and delivering, 1s. (24 cents) per ton. Rent: Empty bags remaining in charge of warehouse keepers longer than six days after discharge of parcel or ship, 6d. (12 cents) per ton per week; bags emptied in warehouse and remaining there, 6d. (12 cents) per ton per week, from the Monday following the date of emptying.

Turning to air.—Grain and seed, 4d. (8 cents) per last; Egyptian cotton seed, 2½d. (5 cents) per ton; all other kinds of cotton seed, 4d. (8 cents) per ton.

Weighing over in warehouse.—Grain and seed, 2s. 6d. (60 cents) per last; Egyptian cotton seed, 1s. 6d. (36 cents) per ton; all other kinds of cotton seed, 1s. 10d. (44 cents) per ton.

Extra weighing.—At the time of housing or delivering, when not otherwise provided for in the rates: Grain and seed, 5d. (10 cents) per last; cotton seed, 3d. (6 cents) per ton.

Ripping original bags.—Shooting into sacks in warehouse, bagging, tying, and twine, 10d. (20 cents) per last.

Screening, etc.—By boby or other pattern machines, 7d. (14 cents) per quarter; by common screen, 3d. (6 cents) per quarter; by hand-blowing machine, 3½d. (7 cents) per quarter.

Labor.—For operations not previously named, 7s. ($1.70) per man per day.

Sampling.—Sampling, sealing samples, taking average of grain or seed, other than Indian, not more than 2 per cent of the parcel, 6s. ($1.46) per 1,000 quarters; where taking average is not performed, 3s. 6d. (85 cents) per 1,000 quarters; taking average of bulk cargoes, 3s. (73 cents) per 1,000 quarters; sampling and sealing samples of grain and seed from Kurrachee, when performed on behalf of the shipper, in addition to sampling, sealing, and taring on behalf of the consignee, 3s. (73 cents) per 100 tons; sampling, sealing samples, and taring Indian grain and seed, not more than 2 per cent of the parcel, 6s. ($1.46) per 100 tons.

Registration of transfers.—The charge for registering transfers of grain and seed will be one week's rent on each lot transferred, with a maximum charge of 2s. 6d. (60 cents) per lot, payable by the party issuing the order.

Charges for working overside ship to craft.—Grain and seed, except Indian, weighing and delivering in bulk or original bags, 1s. 2d. (28 cents) per last; weighing and delivering, including bagging, tying, and twine, 1s. 8d. (40 cents) per last; Indian, 34 and 36 cents per last.

Regulations.—The ex ship rates will not apply to grain, seed, or cotton seed in lighters at the time that housing instructions are received by the warehouse keepers.

All charges on grain, seed, or cotton seed housed shall be paid or payment guaranteed by the parties in whose names they are housed, unless transferred in the warehouse keeper's books, and in no case will transfer of a portion of a bulk be made unless the grain, seed, or cotton seed be actually weighed over.

Rent will be charged in the case of parcels of grain, seed, or cotton seed ex steamer as well as ex sailing vessels from the date on which the first portion of such parcel is deposited in the warehouses, or is delivered to craft for warehouse, and in case of arrival of entire cargoes or parts of entire cargoes from a date halfway between that on which the landing of the cargo or delivery to craft for warehouse was commenced, and that on which it was completed, and all fractions of a week (after the first week) exceeding three days shall be charged as one week; but all grain, seed, or cotton seed warehoused shall be charged one week's rent at the least.

When grain, seed, or cotton seed has been turned overside into lighters belonging to or hired by the warehouse keepers, under the ex ship rate, and remains there for merchant's convenience more than three days from the commencement of the discharge into lighter or lighters, the ex lighter rate will be charged, plus lighterage of not less than 1s. 4d. (32 cents) per last. If the lighters do not belong to the warehouse keeper, the lighterage charge must be paid direct by the merchant.

Unless grain, seed, or cotton seed has been weighed by the warehouse keeper's own servants, immediately before, or when being housed, the warehouse keepers will not be liable for any difference in weight, neither will the warehouse keepers be liable for any loss or damage which may arise through riots, strikes, or combinations of workmen, fires, storms, frosts, exceptional tides, weevils or other vermin, from shrinkage from natural causes, or from other unforeseen contingencies, in respect of any grain, seed, or cotton seed worked, warehoused, or delivered by them.

The rates quoted in the foregoing for grain and seed do not include insurance or other owner's risks, either in craft or elsewhere.

WM. P. SMYTH,
Consul.

HULL, *July 17, 1902.*

REPORT FROM LIVERPOOL.

In Liverpool, there is no supervision of warehouses, either local or national, on which bankers and trust companies can depend for the existence of the collateral or its value. The method adopted by the warehouse companies, whether private or trust companies, and those interested, is as follows:

As soon as goods are received in warehouse, the owner receives from the warehouse company a notice to the effect that they hold at the disposal of the owner, in their warehouse, certain goods, describing the number of packages and contents, which notice is not transferable. In the event of the owner wishing to use such stored goods as collateral for loans, he applies to the bank, producing the notice referred to, and when the loan is negotiated the owner notifies the warehouse company that the goods referred to, or part thereof, as the case may be, have been transferred by him to the bank, whereupon the first notice is canceled. The bank then makes application to the warehouse company and receives a notice similar to the one issued in the first instance, to the effect that they hold at the disposal of the bank, in their warehouse, the goods described therein. Loans are never made by the banks until the notice is received from the warehouse company that the goods are in their warehouse to the order of the bank. When the original owner wants delivery of a portion of the goods, he makes his financial arrangements with bankers and obtains their order on the warehouse company for the required quantity. In the event of such stored goods being delivered to other persons than those holding them as collateral for loans, the warehouse company is held responsible, unless they get the written order of the holders. Sometimes owners of goods, when putting them in warehouse, require, instead of the nontransferable notice, a delivery warrant, which is transferable by indorsement. The reason this warrant is not generally used is on account of the necessity of its production every time a portion of the goods covered by it is taken out of warehouse, for the quantity withdrawn to be indorsed thereon.

Inspectors may at any time visit the warehouses in the interest of the banks or trust companies, for the purpose of seeing the goods held as collateral, or the banker may require from time to time to be furnished by the warehouse company with particulars as to the quantities of such goods in warehouse and the quantity delivered.

JAMES BOYLE,
Consul.

LIVERPOOL, *July 10, 1902.*

REPORT FROM MANCHESTER.

I am informed by the leading banks here that the practice in question is not largely in vogue in Manchester—certainly not as much as in Liverpool, where warehouse warrants and dock warrants are more numerous and are regularly deposited with the banks as security.

Dock and warehouse warrants issued by the large public storing companies and firms are considered fair security with a margin to cover charges of storage and possible depreciation in value. Such warrants specify that the goods are transferable by special indorsement and entitle the last indorser to the goods specified.

Delivery orders, warehouse certificates, and documents of a similar character do not give a good title until the goods are registered in the name of the claimant or until possession of them is obtained. Such delivery orders are not considered a desirable security.

Shippers sometimes obtain temporary advances against cloth in the hands of the printers or of the packers; a letter of lien is given to the bank, notice of which is given by the bank to the party holding the goods, and an acknowledgment is obtained from the said party.

The printers or packers have a prior lien on all goods in their hands in claims against the owner of the goods. The latter, however, is not considered a satisfactory form of security upon which to make advances, though it is sometimes accepted.

THE MANCHESTER SHIP CANAL COMPANY.

I have obtained through the general superintendent of the abovementioned company the following report, explaining the system in operation at the Manchester docks.

The powers for the issue of certificates and warrants are under the Manchester ship canal act of 1885, section 194, which I give below in extenso:

194. With respect to the giving of certificates and warrants by the company for the delivery of goods, the following provisions shall have effect—that is to say:

1. The company, from time to time, at the request of any person warehousing or depositing any goods in any warehouse or upon or in any of the quays or sheds of the company specially appropriated for the purpose, or entitled to any goods so warehoused or deposited, may, if the company think fit, issue and deliver to him a certificate in a form approved by the company of the goods so warehoused or deposited, or a warrant in a form approved by the company, for the delivery of the goods so warehoused or deposited, or any part thereof, to be respectively specified in the warrant.

2. No such warrant for delivery shall be given unless and until all liens and claims for freight and all other liens or claims whatsoever to which the goods were liable while on board any vessel and before the warehousing or depositing of the same, and of which the company have notice in writing, and all rates, rents, charges, and expenses payable to the company with respect to the warehousing or depositing of the goods, or for services performed by the company in respect thereof, are paid or discharged.

3. Before a warrant for the delivery of all or any of the goods specified in any certificate is issued by the company, the certificate shall be delivered to them to be canceled; provided, that if the warrant be for the delivery of part only of the goods, the company shall issue to the person so delivering up the certificate a new certificate with respect to the goods not specified in the warrant.

4. Every such certificate or warrant for delivery shall be deemed to be a document of title to the goods specified therein, and shall be transferable by indorsement, and any holder of such certificate or warrant, whether the person named therein or the indorsee thereof, shall have the same right to the possession and property of such goods as if they were deposited in his own warehouse.

5. Every such certificate or warrant shall state on the face thereof the effect of the last preceding subsection, and that the certificate or warrant is issued under the powers of this act.

6. The company may charge for each certificate or warrant any sum not exceeding 2s. (49 cents).

Our actual practice in manipulating warrants is as follows:

First, a person having goods stored in the company's storage warehouses or grain elevator may request us to issue dock warrants. The warehouseman in charge of the particular warehouse where the goods are stored then inspects the goods, and, if found correct, issues a declaration enumerating the goods and stating—

"The within named goods are now stored in ——— and are in ——— condition."

This declaration is based upon the assumption that the contents of packages are as described by the owner, as packages are not opened to verify such description.

Upon receipt of this declaration, a warrant or warrants (according to the requirements of the owner) are issued by us to the holder of the goods, who then negotiates an advance upon them through one or other of the banking houses, and before any deliveries of goods named on issued warrants are made by us we require the warrants to be indorsed by the banking firm interested, and also require the latter to send us the warrants along with their instructions to us to release the goods or any portion of them, which release we keep and return to the banking firm the original warrants, after entering on the back of same particulars of the goods so released, and so on until the whole of the goods on the warrants are exhausted, when we retain the warrants (which accompany the release of the balance of the goods) and write across the same the word "canceled," and file the documents for future reference, should the same be required, which is of very rare occurrence.

We make a charge against the person who requests us to issue the warrants of 12 cents for each warrant, which charge also covers the stamping duty of 6 cents per warrant.

Before a warrant becomes negotiable through a bank, it requires to be duly signed by either of four officials employed by us, the acceptance of whose signatures has been authorized by the company's board of directors.

We are occasionally asked by importers or merchants who have goods stored in our warehouses to their order to hold the same to the order of some bank, and in such cases we advise the bank on one of our ordinary warehousing advice forms that such goods are held to their order.

In respect of such goods, we honor delivery orders issued by the bank without requiring the return of our advice for indorsement of the goods delivered, we ourselves taking care that no delivery orders are honored by us for quantities in excess of those mentioned in our advices to the bank.

Our general system is, however, to issue warrants as before stated.

These warehousing advices do not require to be stamped by us, but transfer and delivery orders, when of the value of $9.73 or over, require each to have a 1-penny stamp affixed by the persons issuing them to us.

WILLIAM F. GRINNELL,
MANCHESTER, *July 12, 1902.* *Consul.*

REPORT FROM NEWCASTLE-ON-TYNE.

The railway companies in this country are usually the public wharfingers and warehousemen. They issue receipts or warrants for goods in their possession, and these pass from hand to hand by indorsement and are everywhere negotiable.

These warrants bear a 3d. (6-cent) revenue stamp, are contained in duplicate in a book numbered consecutively, and are jealously guarded. One copy remains in the book and the other is handed to the depositor of the goods. They are signed by the various officials concerned, including the weighman, inspector, etc. Great care is exercised in preparing the warrants to see that the weight and brand are correctly entered, so that there can be no mistake on delivery, and it is only on presentation of the warrant that the goods are given up.

They are available for any goods which may be deposited with the railway company for storage and safe-keeping. The security is absolute, and advances are made upon them without question (the credit and good standing of the borrower being, of course, taken into consideration).

In this consular district the Connals are the warehousemen more immediately concerned with iron. The iron is brought to their yard in

Middlesborough, weighed and examined, and a receipt is given—the so-called "warrant."

I am not aware of any State or other official supervision, but the warehousemen are fully liable under the law, and firms like Connal's and the different railway companies are, of course, perfectly sound. There is, therefore, never any question as to the validity of their warrants, and all the banks take them readily as collateral security for loans.

HORACE W. METCALF,
Consul.

NEWCASTLE-ON-TYNE, *August 23, 1902.*

REPORT FROM PLYMOUTH.

The large shipping interests of the British Isles long ago made it imperative that sound and reliable methods be established, by which goods stored in warehouses, on docks, and even in the holds of vessels in passage, could be used as collateral for loans. These methods have been extended and perfected by usage and experience, and the custom of converting merchandise of this class into safe and valuable assets for banking and other purposes is carefully guarded by several public and private acts of Parliament.

"With respect to giving credit on such securities," remarks a writer on this subject, "it is obviously impossible for one to be of any assistance in suggesting to mercantile men whom to trust and with whom to deal. The utmost he can do is to point out what form of security is recognized by the law as valid, so that if the person to whom credit is given or advances are made proves to be less honest or less solvent than was expected, the lender shall be protected to the extent of the value of the security."

BRITISH LAWS.

I would also refer the reader to the factor's act, sale of goods act, bankruptcy act, and to the several other public and private acts of Parliament bearing on this subject; also to the lectures delivered by A. R. Butterworth, esq., barrister at law, before the Institute of Bankers, London.

In the city of Plymouth, the banks confine their loans or advances on such securities almost exclusively to dock warrants and bills of lading. The following is a brief summary of the law on dock warrants and bills of lading:

> When goods are warehoused at the docks upon their importation, they are entered in the warehouse books in the name of the importer. To him is then given a certificate, called a dock warrant, which contains the same particulars of the goods as the landing account and states that they are deliverable to the owner or his assigns by indorsement thereon. By modern mercantile practice, judicial recognition, and ultimately by the factor's act, 1889, a dock warrant has become what is

known in law as a document of title. By this expression is meant a document used in the ordinary course of business as proof of the possession or control of goods, or authorizing, or purporting to authorize, either by indorsement or delivery, the possessor of the document to transfer or receive goods thereby represented. A dock warrant is liable to a stamp duty of 3d. (6 cents). An indorsement of a dock warrant operates to transfer to the indorsee the actual property in, and possession of, the goods it represents. The indorsee, or the original owner if it has not been transferred, is entitled to present the dock warrant at the warehouse and demand delivery of the goods; but it is a usual practice for its holder to leave the warrant at the warehouse and to take possession of the goods as he may require them, by means of a delivery order.

The holder of the dock warrant, being thus entitled to at once present it at the warehouse and obtain delivery of the goods he has bought, is in this respect in a somewhat different position from the holder of a bill of lading, who, on account of the goods being in course of transit, is unable to at once obtain possession of them. For this reason, the law distinguishes somewhat between the two documents. The holder of the dock warrant who has obtained it, as a buyer of the goods it represents, direct from the person to whom the warrant was issued, and who would be in this case the seller of the goods it represents, is not really the holder of a document of title as would be a similar holder of a bill of lading. He is merely the holder of an offer or authority to receive the goods, and the person to whom the warrant was issued, and who is the seller to him of the goods it represents, is entitled to stop the delivery of the goods to the buyer in case any part of the purchase is remaining unpaid. But in a case where the dock warrant has been regularly transferred by that buyer to a third person, who has taken it in good faith and for a valuable consideration, the seller loses the before-mentioned right of stoppage. And so, also, in cases where the third person has in his turn indorsed it to further holders for value.

And particularly is it so in cases where the original owner of the dock warrant has given it into the possession of a factor, middleman, or other similar class of third party, and when the latter has transferred or pledged it. The general position in such a case as the last is that if a mercantile agent is, with the consent of the owner, in possession of documents of title to goods, any sale or pledge of the goods made by him is valid, unless the person taking under the sale or pledge had notice that it was unauthorized; in the absence of evidence to the contrary, the consent is to be presumed. If a dock warrant is stolen, not even a bona fide holder for value, who has taken from the thief, acquires a good title to the goods; he is, however, protected from stoppage in transitu in respect of the vendor's lien. Together with the warrant, the warehouse authorities may deliver to the importer a weight note. Where this is done, the goods will not be delivered up as against the warrant without its corresponding weight note.

JOS. G. STEPHENS,
Consul.

PLYMOUTH, *August 17, 1902.*

REPORT FROM TUNSTALL.

Very little of this business is carried on in this consular district. I have, however, been able to obtain the following information from a high authority on the matter:

Banks here advance largely on goods stored to their order, or they hold the warrants for the goods. The principal business in this line is, of course, in cotton. The warehouses take no liability for the value of the goods, but simply hold them for safe custody as a bank does deed boxes, without any guaranty as to their contents. The chief security we have is our own customer, whose representatives see and mark each bale of cotton as it is unshipped. It then goes either straight to the warehouse to our order or direct to the spinners. If to the former, the warehousers send us advice that they have received so many bales of cotton marked ———, and that advice should tally with the customer's instructions; if so, we assume the matter to be right. The warehousemen accept no responsibility beyond what is actually stated on their advice, viz, 10 bales cotton marked ———; 20 bales wool marked ———; 300 pieces spruce timber marked ———.

They do not insure against fire nor take any risks against flood, tempest, or the act of God, but to a large extent the conditions stated on warrants and advices are governed by custom. Bankers have no actual proof that the goods are "in being" unless they go and inspect, and are entirely dependent on the warehouser and their customer. These two would have to be in collusion to cheat. A practice is not made of inspecting the goods. Railway companies and warehousers report periodically what stands in bankers' books against them and ask for confirmation, which constitutes a "chose in action" against them in case the goods prove to be non est.

WM. HARRISON BRADLEY,
Consul.

TUNSTALL, *July 9, 1902.*

SCOTLAND.

REPORT FROM EDINBURGH.

In Scotland, there are many public warehouses in which large quantities of goods are stored or deposited. These warehouses are of two classes, viz, customs or bonded warehouses, in which are stored goods which are liable to customs duty, and ordinary warehouses, which are available for all classes of nondutiable goods or goods upon which duty has been paid. As in the case of ordinary warehouses, the bonded warehouses are under the control of the warehousemen and the Government is not responsible for goods stored in any of them. Loans are frequently made by bankers and others upon the security of goods stored in public warehouses. The banker or other party lending has always perfect confidence in the warehouseman or custodier of the goods. Such loans in Scotland, are regulated by the law of pledge. In minor details, the practice may vary slightly, but the legal requirements upon which the method of creating securities over goods in warehouses is based are well established. They are these:

LEGAL REQUIREMENTS.

There must be three independent persons, viz, (1) the borrower—the owner of the goods— (2) the lender, and (3) the warehouseman. The goods are stored in the warehouse in the name of the lender, or, if such goods are already in an independent warehouse, a delivery order is by the borrower granted to the warehouseman, requiring him to hold the goods to the order of the lender; that order is then intimated to the warehouseman. Thereafter, a warehouseman's certificate is issued to the lender, stating that the goods so stored are held to his order. The lender is named in the certificate without any reference to his position as creditor.

The following examples will sufficiently indicate the general nature of the warehouse certificate, or warrant, and the delivery order referred to in the preceding paragraph:

EXAMPLE OF WAREHOUSE CERTIFICATE, OR WARRANT.

Warrant for ten (10) tons of butter transferred in our books and held to the order of A. B. Rent begins 4th March, 1902.

THE CLYDE BONDING COMPANY.

GLASGOW, *4th March, 1902.* G. H., *Manager.*

EXAMPLE OF DELIVERY ORDER.

To the CLYDE BONDING COMPANY,
Glasgow.

Deliver to C. D., manager of the Western Bank, ten (10) tons of butter marked as undernoted, held by you for me, charging me for rent from date of storage.

GLASGOW, *4th April, 1902.* A. B.

Then follows the marks on the packages of butter.

If the custodian of the goods is identified with the owner thereof, or if the goods are stored in the borrower's own warehouse, there ceases to be a third independent person, and hence, on the bankruptcy of the borrower, such goods would in general pass to his creditors to the exclusion of the lender.

The goods when stored are insured either (1) in name of the lender, or, (2) if the policy has already been issued in the name of the borrower, that policy is indorsed to the lender. Frequently, the storekeeper has a floating policy covering all goods in his warehouse, and, of course, in such a case there is no need for the creditor to specially insure.

The usual right of the lender is to retain the goods until the debt is paid. He is obliged to preserve them with due care and to restore them to the owner on payment of his debt. The property in the goods, and therefore the risk, remains with the owner. In the absence of a special contract, the lender has no power to sell the goods upon the expiration of the time fixed for repayment of the loan, without first making application to the sheriff of the county and from him receiving a warrant to sell.

These rules are, of course, subject to alteration by express contract of the parties, by which the rights of a lender may be enlarged or modified.

At the time a loan is made, an absolute power of sale—which may be put into effect immediately upon the expiration of the time limit fixed for the repayment of the loan, without any authority being obtained from the sheriff—may be given to a lender, by a special contract; but such a contract is unusual. In all cases, the right of the lender to the proceeds of a sale of goods held in security of a loan is limited to the amount due to him—principal sum, interest thereon, and expenses incurred—and he is bound to account to the borrower for any surplus.

TRANSFERS OF WARRANTS.

Warehouse warrants, or certificates, and delivery orders are not negotiable documents according to the law of Scotland (that is to say, they can not pass from one person to another, *e. g.*, like a bill of exchange). Notice of all transfers of warehouse warrants and delivery orders must be given to the warehouse keeper, who usually issues a fresh warrant, or certificate, in the name of the transferee. Notice to the warehouse keeper is indispensable, as the goods would otherwise remain open to the diligence of the creditors of the borrower. The principle upon which the right of the security holder is held to be complete, on notice being given, is that from that time the warehouseman is held as his agent, instead of as the agent of the grantor of the security, and the goods are therefore transferred by constructive delivery.

The present system has been found to work well in Scotland, as public warehouse keepers are, as a general rule, sound and trustworthy. There have, however, been instances in recent years where goods have been fraudulently sold or pledged in security to two or more different parties at the same time, but such occurrences are rare.

Certain warehouse keepers, who are also auctioneers, occasionally themselves lend money on goods stored with them—chiefly furniture. Such loans, are, as a rule, comparatively small.

FREDERICK PIATT,
Vice and Deputy Consul.

EDINBURGH, *July 24, 1902.*

REPORT FROM DUNDEE.

From inquiries made at the leading banks in the city, I learn that the general practice, where a customer desires an accommodation from the bank on the security of stored goods, is to have the warehouse keeper's warrant made out in the bank's own name. The goods are thus under the control of the bank and can be transferred only upon the bank's delivery order. Advances to within from 25 to 10 per cent of full value are made, according to the nature of the goods; but such advances are made only when the warehouseman is known to the bank. In Dundee, there are not many public warehouse companies, and these are known to the banks to be sound concerns, whose warrants are absolutely reliable. They will not accept the warrants of warehousemen who are unknown to them, and in such cases there is no method in existence whereby these warrants can be made acceptable to the bank. There is no supervising body, either State, municipal, or corporate, by whose imprimatur warehouse warrants could be authenticated in such a way as to make them safe assets for banking purposes.

JOHN C. HIGGINS,
Consul.

DUNDEE, *September 12, 1902.*

REPORT FROM GLASGOW.

There is in Glasgow, as in all large commercial cities in this country, an extensive system for the storage of goods. The storekeepers are, as a rule, of good financial standing and business integrity. Many of them are corporate companies having considerable capital and extensive premises. There is no municipal or State supervision, except in the case of premises adapted for the storage of dutiable goods, which are supervised by a Government officer in the interests of the public revenue.

Advances are freely given by bankers and others on the security of goods in store. When an advance is required by the owner of goods in a public store, he grants what is called a delivery order, addressed to the storekeeper in favor of the person granting the advance. The usual terms of the delivery order are simple enough. It is: "Deliver to A B or his order [so many goods, identified by marks and numbers], lying at present in your store." It is signed by the owner, and is in favor of the party therein named who may be granting the advance. That order is not of the least use to the grantee until he has gone with it to the storekeeper and has got the storekeeper to transfer the goods to the grantee's name in the store books. To obtain an effectual security under the delivery order, the essential matter is to intimate the order to the storekeeper, and, to prevent any questions, to get his consent to hold the goods thereafter for the person in whose favor the order was granted.

The usual form in which this consent is given is by a letter from the storekeeper to the grantee, whereby in respect of such and such a delivery order he acknowledges that he holds the goods on behalf of the grantee. That is the form of completing the transaction in order to make the security effectual.

SCOTCH LAW.

The necessity for intimation arises out of the doctrine of the common law of Scotland, which, differing from that of England, made delivery necessary to the completion of every contract involving a change in the ownership of movable goods. This has been altered in sale by the sale of goods act of 1893, which assimilates the law of Scotland to that of England in regard to the contract of sale. So far as the contract of pledge—by which goods are transferred in security of an advance—is concerned, the law still is that delivery, actual or constructive, is necessary to the completion of the security. In the case of goods in store, intimation to the storekeeper is held to be constructive delivery.

The importance of this doctrine has quite recently been illustrated in a case which was heard before seven judges of the supreme court of Scotland and afterward on appeal to the House of Lords (Inglis vs. Robertson & Baxter, July 11, 1898). The rubric of the case bears:

> Goldsmith, a domiciled Englishman resident in London—the owner of certain whisky lying in a bonded warehouse in Glasgow, and holding a warrant granted by the warehouse keepers bearing that they held the whisky to order of Goldsmith, "or assigns by indorsement hereon"—by contract executed in London, borrowed £3,000 from Inglis, also a domiciled Englishman, on the security of the whisky, and indorsed and delivered the warrant to Inglis. The assignation to Inglis was not intimated to the warehouse keepers. Thereafter, Robertson & Baxter, creditors of Goldsmith, arrested the whisky in the hands of the warehouse keepers.
>
> In a competition between Robertson & Baxter and Inglis, who maintained that under the law of England, by the indorsement and delivery of the warrant, he had acquired a right to the whisky which was preferable to that of any creditor of Goldsmith doing diligence subsequently, held (affirming judgment of the court of session, whole court) (1) that the competition fell to be determined by the law of Scotland, and (2) that as the assignation had not been intimated to the warehouse keepers, the real right remained in Goldsmith, subject to the diligence of his creditors.

DELIVERY ORDERS.

The delivery order, though capable of indorsement, is not a negotiable instrument according to the law of Scotland, and this often leads to important results. The bona fide holder for value of a negotiable instrument is entitled absolutely to implement of its exact terms, according to its precise tenor. A delivery order is different. An indorsee of a delivery order is not in the position of a holder of a negotiable instrument, like a bill. In the case of a delivery order, an indorsee is subject to all the exceptions arising out of the real contract between the original grantor and the original grantee. One important consequence is that the original grantor of the delivery order can hold the goods for the unpaid price against any indorsee whatever, even against an indorsee for full value. The only way to complete the title under a delivery order which shall exclude any such retention by the unpaid seller is to get the storekeeper to acknowledge the indorsee as the owner or transferee of the goods by letter, as before mentioned. Before this is done, the original grantor of the order, if he be an unpaid seller, is entitled to go to the storekeeper and stop or countermand the order. He is entitled to say to the storekeeper: "I have not been paid my price, and I require you to retain the goods for me and to deliver them to nobody whomsoever, neither to the original grantee nor to any subsequent indorsee from him." If the delivery order were in law held to be a negotiable instrument, an indorsee for value could demand delivery, irrespective of the fact that the price had not been paid to the original seller.

There is another point in regard to these delivery orders; it arises in the case of a merchant who holds goods in his own store exclusively occupied by him, or a merchant who keeps a store into which he receives the goods of others as well as his own goods. A delivery order granted by that merchant on his own storekeeper is of no use at all as an instrument for passing the property, so long as the goods are allowed to remain in the same store. If one gets a delivery order from such a merchant, and even gets his storekeeper to accept liability for the goods to the transferee, that will not transfer the property nor complete the security. This seems a curious result, but it is a necessary consequence of the common law on the subject. If the goods are in a merchant's own store, although he is also a public storekeeper, no transferee can have any vested right in the goods unless he takes delivery and attains actual possession. The storekeeper of the owner is only a servant of the owner, and any acknowledgment granted by such storekeeper does not suffice in law to pass the right to a transferee. That seems a hard result, but it simply follows from the doctrine that when goods are in the possession of the owner himself and not in the hands of an independent storekeeper, the only way to complete the right of a transferee is to take delivery.

These, so far as the law and practice in Glasgow and Scotland is concerned, are the principal points about delivery orders: There must be three parties—the grantor, the grantee, and the independent storekeeper; if the original price is not paid to the grantor of the order, he may retain the goods against the grantee or indorsee from him; and a delivery order granted by a merchant on his own storekeeper is of no avail unless the transferee gets actual delivery.

IRON WARRANTS.

There is a delivery order which is in vogue particularly in the west of Scotland, the seat of the great iron market and the principal Scotch iron works. The ironmasters grant warrants somewhat as follows:

> I will deliver [so many tons of iron of a specified brand] to any person who shall lodge this document with me after a certain date.

It is a warrant in favor of the bearer. These warrants are very much used, particularly in Glasgow, and pass from hand to hand without indorsement. A warrant may pass through fifty hands before it comes to the man who actually goes to the ironmaster and takes delivery of the iron. These warrants are treated in practice as if they were negotiable instruments, although in strict law and according to the older Scotch authorities they are not so. They are used, and enormous transactions depend upon their validity by the existing custom among merchants. Ironmasters, for their own interests, raise no questions as to their validity, and in that way these warrants are effectual.

In conclusion, I may say that in Glasgow large values in goods stored can be freely used as collateral for loans and for banking purposes. The utmost confidence appears to exist between the merchant owners and the storekeepers on the one hand and the bankers and financiers on the other. I could not find any merchant who was prepared to say that this confidence and the freedom with which bankers were prepared to make advances on goods in store were the result of any of the peculiar rules to which I have referred. They preferred to believe that they were inspired by a long course of honest trading among the merchants and the recognized responsibility of the storekeepers.

SAMUEL M. TAYLOR,
Consul.

GLASGOW, *July 16, 1902.*

ALGERIA.

The same general laws on this subject that prevail in France apply in Algeria. The following letter from the president of the chamber of commerce gives the method in vogue here:

> In response to your letter of the 24th of June, in which you request information upon the legislation concerning the warehouses (magasins généraux) of Algeria, I have the honor to inform you that the rules governing warehouses arise from the decree of May 28, 1858, completed by that of March 12, 1859, and rendered applicable to Algeria by the decree of March 31, 1860; also the law of August 30, 1870, rendered applicable to Algeria by decree of March 22, 1871.

As the result of these laws, the warehouse (magasin générale) is created by prefectoral order upon the approval of the chamber of commerce; the bond demanded varies from 20,000 to 100,000 francs ($3,800 to $19,000).

The warehouse superintendent is authorized to receive all kinds of merchandise. Upon its presentation at the depot, he issues a double title, transmissible by indorsement, the warrant receipt bearing mention of the kind, the quality, and the value of the merchandise deposited. This title is composed of two parts: First, the receipt, representing the ownership, the indorsement of which transmits to the cessionary the right to dispose of the goods; second, the warrant, or coupon (bulletin de gage), the separate indorsement of which serves as security for the cessionary after the formality of transcription upon the records of the warehouse superintendent.

The goods remain in the care of the warehouse superintendent, who can deliver them only after having received the stub of the warrant receipt emitted by himself.

There are no general warehouses in the city of Algiers, but our Department possesses some, notably at Hussein-Dey, Blida, and Orleanville. They are specially used for the storage of cereals.

Our chamber of commerce is actively considering the project of creating an entrepôt-general at Algiers.

DANIEL S. KIDDER,
Consul.

ALGIERS, *July 3, 1902.*

JAVA.

It has been the custom for years, in this part of the world, for banks to advance loans to different merchants on produce stored in their warehouses.

This business is transacted in a very simple manner, the merchant showing by his books that articles, valued at a certain price, are stored in his warehouse. This statement is generally confirmed by a personal inspection by one of the bank employees, and the loan is advanced accordingly.

A responsible person is then appointed by the merchant and approved by the bank, to take full charge of the warehouse, and the keys of same are supposed to be in his possession. No goods are allowed to be removed from or stored in the warehouse without the knowledge of the keeper and consent of the bank, and he must make a daily report to the bank if any goods are removed or stored.

The keeper's report must be verified by the bank, and should the bank be unable to verify it the keeper is liable to the full extent of the shortage.

The great difficulty in doing business on this system is to find a responsible person who is willing to take charge of the warehouse, and such men demand a very good salary. The keeper must either be a person owning property or one who is able to give good security by bond, as the position is one of great responsibility.

This system of advancing loans on stored goods has been successfully carried out for a number of years in Netherlands-India, and without it it would be almost impossible for the smaller merchants to transact business.

B. S. RAIRDEN,
Consul.

BATAVIA, *August 26, 1902.*

SIBERIA.

There is no private association at Vladivostock that lends money on stored goods. All such business is transacted through the Russo-Chinese Bank, which makes storage charges of 2 kopecks per pood (0.5 cent per 36 pounds), besides fees for insurance, etc. Interest charge is 8 to 9 per cent, and an additional commission is demanded for loans, based upon 50 to 80 per cent of the maximum valuation. No private company could afford to compete with the bank. Warehouses are few in Vladivostock. Several firms have recently secured permits to build on the grounds of the commercial port.

RICHARD T. GREENER,
Commercial Agent.

VLADIVOSTOCK, *July 10, 1902.*

TURKEY IN ASIA.

The two railroads entering Smyrna have large warehouses for accommodating their patrons, wherein goods arriving by rail are allowed three days' storage free of charge. Loans are granted by all the banks on railroad warehouse certificates, but these certificates are not negotiable by a third party. The banks send their own experts to estimate the value of goods and make advances of 70 to 80 per cent of market prices, at 7 to 9 per cent annual interest. If the market value of goods shrinks, the banks demand return of margin. Each banking institution has its own warehouse, in which goods are held as collateral after delivery from the railroad or custom-house. There are no public warehouses other than those indicated above.

RUFUS W. LANE,
Consul.

SMYRNA, *July 11, 1902.*

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SPECIAL CONSULAR REPORTS.

Fuel

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IN

FOREIGN COUNTRIES.

VOL. XXVI.

REPORTS FROM CONSULS OF THE UNITED STATES IN ANSWER TO
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PUBLICATIONS OF THE BUREAU OF FOREIGN COMMERCE.[a]

The publications of the Bureau of Foreign Commerce, Department of State, are:

I.—COMMERCIAL RELATIONS, being the annual reports of consular officers on the commerce, industries, navigation, etc., of their districts.

II.—CONSULAR REPORTS, issued monthly, and containing miscellaneous reports from diplomatic and consular officers.

III.—ADVANCE SHEETS. CONSULAR REPORTS, issued daily, except Sundays and legal holidays, for the convenience of the newspaper press, commercial and manufacturing organizations, etc.

IV.—EXPORTS DECLARED FOR THE UNITED STATES, issued quarterly, and containing the declared values of exports from the various consular districts to the United States for the preceding three months. There is also issued an annual edition of Declared Exports, embracing the returns for the fiscal year.

V.—SPECIAL CONSULAR REPORTS, containing series of reports from consular officers on particular subjects, made in pursuance to instructions from the Department.

Following are the special publications issued by the Bureau prior to 1890:

Labor in Europe, 1878, one volume; Labor in Foreign Countries, 1884, three volumes; Commerce of the World and the Share of the United States therein, 1879; Commerce of the World and the Share of the United States Therein, 1880–81; Declared Exports for the United States, First and Second Quarters, 1883; Declared Exports for the United States, Third and Fourth Quarters, 1883; Cholera in Europe in 1884, 1885; Trade Guilds of Europe, 1885; The Licorice Plant, 1885; Forestry in Europe, 1887; Emigration and Immigration, 1885–86 (a portion of this work was published as CONSULAR REPORTS No. 76, for the month of April, 1887); Rice Pounding in Europe, 1887; Sugar of Milk, 1887; Wool Scouring in Belgium, 1887; Cattle and Dairy Farming in Foreign Countries, 1888 (issued first in one volume, afterwards in two volumes); Technical Education in Europe, 1888; Tariffs of Central America and the British West Indies, 1890.

The editions of all these publications, except Tariffs in Central America, etc., are exhausted, and the Department is, therefore, unable to supply copies.

In 1890 the Department decided to publish reports on special subjects in separate form, to be entitled SPECIAL CONSULAR REPORTS. There are now the following SPECIAL CONSULAR REPORTS:

Vol. 1 (1890).—Cotton Textiles in Foreign Countries, Files in Spanish America, Carpet Manufacture in Foreign Countries, Malt and Beer in Spanish America, and Fruit Culture in Foreign Countries.

Vol. 2 (1890 and 1891).—Refrigerators and Food Preservation in Foreign Countries, European Emigration, Olive Culture in the Alpes Maritimes, and Beet-Sugar Industry and Flax Cultivation in Foreign Countries.

Vol. 3 (1891).—Streets and Highways in Foreign Countries. (New edition, 1897.)

Vol. 4 (1891).—Port Regulations in Foreign Countries.

Vol. 5 (1891).—Canals and Irrigation in Foreign Countries. (New edition, 1898.)

Vol. 6 (1891 and 1892).—Coal and Coal Consumption in Spanish America, Gas in Foreign Countries, and India Rubber.

Vol. 7 (1892).—The Stave Trade in Foreign Countries and Tariffs of Foreign Countries.

Vol. 8 (1892).—Fire and Building Regulations in Foreign Countries.

Vol. 9 (1892 and 1893).—Australian Sheep and Wool, and Vagrancy and Public Charities in Foreign Countries.

Vol. 10 (1894).—Lead and Zinc Mining in Foreign Countries and Extension of Markets for American Flour. (New edition, 1897.)

Vol. 11 (1894).—American Lumber in Foreign Markets. (New edition, 1897.)

Vol. 12 (1895).—Highways of Commerce. (New edition, 1899.)

Vol. 13 (1896 and 1897).—Money and Prices in Foreign Countries.

Vol. 14 (1898).—The Drug Trade in Foreign Countries.

Vol. 15 (1898).—Part I. Soap Trade in Foreign Countries; Screws, Nuts, and Bolts in Foreign Countries; Argols in Europe; Rabbits and Rabbit Furs in Europe, and Cultivation of Ramie in Foreign Countries. Part II. Sericulture and Silk Reeling and Cultivation of the English Walnut.

Vol. 16 (1899).—Tariffs of Foreign Countries. Part I. Europe. Part II. America. Part III. Asia, Africa, Australasia, and Polynesia. Supplement (1900). Tariffs of Chile and Nicaragua.

Vol. 17 (1899).—Disposal of Sewage and Garbage in Foreign Countries; Foreign Trade in Coal Tar and By-Products.

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[a] Formerly Bureau of Statistics. Name changed to Bureau of Foreign Commerce by order of the Secretary of State, July 1, 1897.

Vol. 18 (*1900*).—Merchant Marine of Foreign Countries.

Vol. 19 (*1900*).—Paper in Foreign Countries; Uses of Wood Pulp.

Vol. 20 (*1900*).—Part I. Book Cloth in Foreign Countries; Market for Ready-Made Clothing in Latin America; Foreign Imports of American Tobacco, and Cigar and Cigarette Industry in Latin America. Part II. School Gardens in Europe. Part III. The Stave Trade in Foreign Countries.

Vol. 21 (*1900*).—Part I. Foreign Markets for American Coal. Part II. Vehicle Industry in Europe. Part III. Trusts and Trade Combinations in Europe.

Vol. 22 (*1900 and 1901*).—Part I. Acetic Acid in Foreign Countries. Part II. Mineral Water Industry. Part III. Foreign Trade in Heating and Cooking Stoves.

Vol. 23 (*1901*).—Part I. Gas and Oil Engines in Foreign Countries. Part II. Silver and Plated Ware.

Vol. 24 (*1902*).—Creameries in Foreign Countries.

Vol. 25 (*1902*).—Stored Goods as Collateral for Loans.

Of these SPECIAL CONSULAR REPORTS, Australian Sheep and Wool, Cotton Textiles in Foreign Countries, Files in Spanish America, Fire and Building Regulations, Fruit Culture, Gas in Foreign Countries, India Rubber, Lead and Zinc Mining, Malt and Beer in Spanish America, Port Regulations, Refrigerators and Food Preservation; Sericulture, etc.; Vagrancy, etc., are exhausted, and no copies can be supplied by the Department.

There was also published, in 1899, Proclamations and Decrees during the War with Spain, comprising neutrality circulars issued by foreign countries, proclamations by the President, orders of the War and Navy Departments, and War decrees of Spain.

Of the monthly CONSULAR REPORTS, many numbers are exhausted or so reduced that the Department is unable to accede to requests for copies. Of the publications of the Bureau available for distribution, copies are mailed to applicants without charge. In view of the scarcity of certain numbers, the Bureau will be grateful for the return of any copies of the monthly or special reports which recipients do not care to retain. Upon notification of willingness to return such copies, the Department will forward franking labels to be used in lieu of postage in the United States, Canada, the Hawaiian Islands, Porto Rico, and Mexico.

Persons receiving CONSULAR REPORTS regularly, who change their addresses, should give the old as well as the new address in notifying the Bureau of the fact.

In order to prevent confusion with other Department bureaus, all communications relating to Consular Reports should be carefully addressed, "Chief, Bureau of Foreign Commerce, Department of State, Washington, U. S. A."

VALUES OF FOREIGN COINS AND CURRENCIES.

The following statements show the valuation of foreign coins, as given by the Director of the United States Mint and published by the Secretary of the Treasury, in compliance with the first section of the act of March 3, 1873, viz: "That the value of foreign coins, as expressed in the money of account of the United States, shall be that of the pure metal of such coin of standard value," and that "the value of the standard coins in circulation of the various nations of the world shall be estimated annually by the Director of the Mint, and be proclaimed on the 1st day of January by the Secretary of the Treasury."

In compliance with the foregoing provisions of law, annual statements were issued by the Treasury Department, beginning with that issued on January 1, 1874, and ending with that issued on January 1, 1890. Since that date, in compliance with the act of October 1, 1890, these valuation statements have been issued quarterly, beginning with the statement issued on January 1, 1891.

The fact that the market exchange value of foreign coins differs in many instances from that given by the United States Treasury has been repeatedly called to the attention of the Bureau of Foreign Commerce. An explanation of the basis of the quarterly valuations was asked from the United States Director of the Mint, and under date of February 7, 1898, Mr. R. E. Preston made the following statement:

"When a country has the single gold standard, the value of its standard coins is estimated to be that of the number of grains fine of gold in them, 480 grains being reckoned equivalent to $20.67 in United States gold, and a smaller number of grains in proportion. When a country has the double standard, but keeps its full legal-tender silver coins at par with gold, the coins of both gold and silver are calculated on the basis of the gold value.

"The value of the standard coins of countries with the single silver standard is calculated to be that of the average market value of the pure metal they contained during the three months preceding the date of the proclamation of their value in United States gold by the Secretary of the Treasury. The value of the gold coins of silver-standard countries is calculated at that of the pure gold they contain, just as if they had the single gold standard."

"These valuations are used in estimating the values of all foreign merchandise exported to the United States."

The following statements, running from January 1, 1874, to January 1, 1903, have been prepared to assist in computing the values in American money of the trade, prices, values, wages, etc., of and in foreign countries, as given in consular and other reports. The series of years are given so that computations may be made for each year in the proper money values of such year. In hurried computations the reductions of foreign currencies into American currency, no matter for how many years, are too often made on the bases of latest valuations. All computations of values, trade, wages, prices, etc., of and in the "fluctuating-currency countries" should be made in the values of their currencies in each year up to and including 1898, and in the quarterly valuations thereafter.

To meet typographical requirements, the quotations for the years 1875–1877, 1879–1882, 1884–1887, 1895, 1897, and 1899 are omitted, these years being selected as showing the least fluctuations when compared with years immediately preceding and following.

To save unnecessary repetition, the estimates of valuations are divided into three classes, viz, (A) countries with fixed currencies, (B) countries with fluctuating currencies, and (C) quarterly valuations of fluctuating currencies.

A.—*Countries with fixed currencies.*

The following official (United States Treasury) valuations of foreign coins do not include "rates of exchange."

Countries.	Standard.	Monetary unit.	Value in United States gold.	Coins.
Argentine Republic	Gold and silver	Peso	$0.96,5	Gold—argentine ($4.82,4) and ½ argentine; silver—peso and divisions.
Austria-Hungary[a]	Gold	Crown	.20,3	Gold—20 crowns ($4.05,2) and 10 crowns.
Belgium	Gold and silver	Franc	.19,3	Gold—10 and 20 franc pieces; silver—5 francs.
Brazil	Gold	Milreis	.54,6	Gold—5, 10, and 20 milreis; silver—½, 1, and 2 milreis.
British North America (except Newfoundland).	do	Dollar	1.00	
British Honduras	do	do	1.00	
Chile	do	Peso	.36,5	Gold—escudo ($1.25), doubloon ($3.65), and condor ($7.30); silver—peso and divisions.
Costa Rica	do	Colon	.46,5	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centisimos.
Cuba	Gold and silver	Peso	.92,6	Gold—doubloon ($5.01,7); silver—peso (60 cents).
Denmark	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Ecuador[b]	do	Sucre	.48,7	Gold—10 sucres ($4.8665); silver—sucre and divisions.
Egypt	do	Pound (100 piasters).	4.94,3	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10, and 20 piasters.
Finland	do	Mark	.19,3	Gold—10 and 20 marks ($1.93 and $3.85,9).
France	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany	Gold	Mark	.23,8	Gold—5, 10, and 20 marks.
Great Britain	do	Pound sterling	4.86,6½	Gold—sovereign (pound sterling) and half sovereign.
Greece	Gold and silver	Drachma	.19,3	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti	do	Gourde	.96,5	Silver—gourde.
India[c]	Gold	Rupee	.32,4	Gold—sovereign ($4.8665); silver—rupee and divisions.
Italy	Gold and silver	Lira	.19,3	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan[d]	Gold	Yen	.49,8	Gold—1, 2, 5, 10, and 20 yen.
Liberia	do	Dollar	1.00	
Netherlands	Gold and silver	Florin	.40,2	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland	Gold	Dollar	1.01,4	Gold—$2 ($2.02,7).
Peru[e]	do	Sol	.48,7	Gold—libra ($4.8665); silver—sol and divisions.
Portugal	do	Milreis	1.08	Gold—1, 2, 5, and 10 milreis.
Russia[f]	do	Ruble	.51,5	Gold—imperial ($7.718) and ½ imperial ($3.80); silver—¼, ½, and 1 ruble.
Spain	Gold and silver	Peseta	.19,3	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Switzerland	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey	Gold	Piaster	.04,4	Gold—25, 50, 100, 200, and 500 piasters.
Uruguay	do	Peso	1.03,4	Gold—peso; silver—peso and divisions.
Venezuela	Gold and silver	Bolivar	.19,3	Gold—5, 10, 20, 50, and 100 bolivars; silver—5 bolivars.

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[a] The gold standard went into effect January 1, 1900. (See Commercial Relations, 1899, Vol. II, p. 7.) Values are still sometimes expressed in the florin, which is worth 2 crowns

[b] Gold standard adopted in November, 1900. (See Consular Reports, No. 225, June, 1899.)

[c] For an account of the adoption of the gold standard see Consular Reports, No. 238, p. 359.

[d] Gold standard adopted October 1, 1897. (See Consular Reports, No. 201, p. 259.)

[e] Gold standard adopted October 13, 1900.

[f] For an account of the adoption of the gold standard, see Review of the World's Commerce, 1896–97, p. 254.

B.—*Countries with fluctuating currencies, 1874–1898.*

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1874.	1878.	1883.	1888.	1889.	1890.
Austria-Hungary[a]	Silver	Florin	$0.47,6	$0.45,3	$0.40,1	$0.34,5	$0.33,6	$0.42
Bolivia	do	Dollar until 1880; boliviano thereafter.	.96,5	.96,5	.81,2	.69,9	.68	.85
Central America	do	Peso	.96,5	.91,8	....	.69,9	.68	.85
China	do	Haikwan tael	1.61	....	....	....	....	....
Colombia	do	Peso	.96,5	.96,5	.81,2	.69,9	.68	.85
Ecuador	do	do	.96,5	.91,8	.81,2	.69,9	.68	.85
Egypt[b]	Gold	Pound (100 piasters).	....	4.97,4	4.90	4.94,3	....	....
India	Silver	Rupee	.45,8	.43,6	.38,6	.32,2	.32,3	.40,4
Japan	Gold	Yen	.99,7	.99,7	....	.99,7	.99,7	.99.7
	Silver		....	....	.87,6	.75,3	.73,4	.91,7
Mexico	do	Dollar	1.04,7¼	.99,8	.88,2	.75,9	.73,9	.92,3
Netherlands[c]	Gold and silver.	Florin	.40,5	.38,5	....	....	....	....
Peru	Silver	Sol	.92,5	.91,8	.81,2	.69,9	.68	.85
Russia	do	Ruble	.77,17	.73,4	.65	.55,9	.54,4	.68
Tripoli	do	Mahbub of 20 piasters.	.87,09	.82,9	.73,3	.63	.61,4	.76,7

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1891.	1892.	1893.	1894.	1896.	1898.
Austria-Hungary[a]	Silver	Florin	$0.38,1	$0.34,1	....	....	....	....
Bolivia	do	Boliviano	.77,1	.69,1	$0.61,3	$0.51,6	$0.49,1	$0.42,4
Central America	do	Peso	.77,1	.69,1	61,3	.51,6	.49,1	.41,4
Colombia	do	do	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
Ecuador	do	do	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
India	do	Rupee	.36,6	.32,8	.29,2	.24,5	.23,3	.20,1
Japan[d]	do	Yen	.83,1	.74,5	.66,1	.55,6	.52,9	....
Mexico	do	Dollar	.83,7	.75	.66,6	56	.53,3	.46
Peru	do	Sol	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
Russia[d]	do	Ruble	.61,7	.55,3	.49,1	.41,3	.39,3	....
Tripoli	do	Mahbub of 20 piasters.	.69,5	.62,3	.55,3	.46,5	.44,3	....

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[a] The silver standard prevailed in Austria-Hungary up to 1892. The law of August 2 of that year (see Consular Reports, No. 147, p. 623) established the gold standard.

[b] The Egyptian pound became fixed in value at $4.94,3 in 1887.

[c] The Netherlands florin fluctuated up to the year 1880, when it became fixed at 40.2 cents.

[d] See footnote, table of fixed currencies.

C.—*Quarterly valuations of fluctuating currencies.*

Countries.	Monetary unit.	1900.				1901.			
		Jan. 1.	Apr. 1.	July 1.	Oct. 1.	Jan. 1.	Apr. 1.	July 1.	Oct. 1.
Bolivia	Silver boliviano	$0.42,7	$0.43,6	$0.43,8	$0.45,1	$0.46,8	$0.45,1	$0.43,6	$0.42,8
Central America.	Silver peso	.42,7	.43,6	.43,8	.45,1	.46,5	.45,1	.43,6	.42,8
China	Amoy tael	.69,1	.70,5	.70,9	.72,9	.75,7	.72,9	.70,5	.69,1
	Canton tael	.68,9	.70,3	.70,7	.72,7	.75,5	.72,7	.70,3	.68,9
	Chefoo tael	.66,1	.67,4	.67,8	.69,7	.72,4	.69,7	.67,4	.66,1
	Chinkiang tael	.67,5	.68,8	.69,3	.71,2	.74	.71,2	.68,8	.67,5
	Fuchau tael	.64	.65,2	.65,6	.67,4	.70,1	.67,5	.65,2	.64
	Haikwan tael	.70,3	.71,7	.72,1	.74,2	.77,1	.74,2	.71,7	.70,4
	Hankau tael	.64,7	.65,9	.66,3	.68,2	.70,9	.68,2	.65,9	.64,7
	Hongkong tael	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
	Ningpo tael	.66,5	.67,7	.68,2	.70,1	.72,8	.70,1	.67,8	.66,5
	Niuchwang tael	.64,8	.66,1	.66,5	.68,4	.71	.68,4	.66,1	.64,8
	Shanghai tael	.63,1	.64,4	.64,8	.66,6	.69,2	.66,6	.64,4	.63,2
	Swatow tael	.63,9	.65,1	.65,5	.67,4	.70	.67,4	.65,1	.63,9
	Takao tael	.69,6	.70,9	.71,4	.73,4	.76,2	.73,4	.70,9	.69,6
	Tientsin tael	.67	.68,3	.68,7	.70,7	.73,4	.70,7	.68,3	.67
Colombia	Silver peso	.42,7	.43,6	.43,8	.45,1	.46,8	.45,1	.43,6	.42,8
India	Silver rupee[b]	.20,3	.20,7	.20,8	....	....	....	....	....
Mexico	Silver dollar	.46,4	.47,3	.47,6	.49	.50,9	.49	.49	.46,4
Persia	Silver kran	.07,9	.08	.08,1	.08,3	.08,6	.08,3	.08,3	.07,9
Peru[c]	Silver sol	.42,7	.43,6	.43,8	.48,7	....	....	....	....

Countries.	Monetary unit.	1902.				1903.
		Jan. 1.	Apr. 1.	July 1.	Oct. 1.	Jan. 1.
Bolivia	Silver boliviano	$0.41,3	$0.40,3	$0.38,2	$0.38,4	$0.36,1
Central America	Silver peso	.41,3	.40,3	.38,2	.38,4	.36,1
China	Amoy tael	.66,9	.65,1	.61,8	.62	.58,4
	Canton tael	.66,7	.64,9	.61,7	.69	.58,2
	Chefoo tael	.63,9	.62,3	.59,1	.59,3	.55,8
	Chinkiang tael	.65,3	.63,6	.60,4	.60,6	.57
	Fuchau tael	.61,8	.60,2	.57,2	.57,4	.54
	Haikwan tael	.68	.66,3	.62,9	.63,1	.59,4
	Hankau tael	.62,6	.60,9	.57,9	.58	.54,6
	Hongkong tael	(a)	(a)	(a)	(a)	(a)
	Ningpo tael	.64,3	.62,6	.59,5	.59,6	.56,1
	Niuchwang tael	.62,7	.61,1	.58	.58,2	.53,3
	Shanghai tael	.61,1	.59,5	.56,5	.56,7	.53,9
	Swatow tael	.61,8	.60,2	.57,1	.57,3	.58,8
	Takao tael	.67,3	.65,5	.62,2	.62,4	.56,6
	Tientsin tael	.64,8	.63,1	.59,9	.60,1	.60,1
Colombia	Silver peso	.41,3	.40,3	.38,2	.38,4	.36,1
Mexico	Silver dollar	.44,9	.43,7	.41,5	.41,7	.39,2
Persia	Silver kran	.07,6	.07,4	.07	.07,1	.06,6

[a] The "British dollar" has the same legal value as the Mexican dollar in Hongkong, the Straits Settlements, and Labuan.

[b] The sovereign is the standard coin of India, but the rupee is the money of account. See also table of fixed currencies.

[c] See footnote, table of fixed currencies.

FOREIGN WEIGHTS AND MEASURES.

The following table embraces only such weights and measures as are given from time to time in Consular Reports and in Commercial Relations:

Foreign weights and measures, with American equivalents.

Denominations.	Where used.	American equivalents.
Almude	Portugal	4.422 gallons.
Ardeb	Egypt	7.6907 bushels.
Are	Metric	0.02471 acre.
Arobe	Paraguay	25 pounds.
Arratel or libra	Portugal	1.011 pounds.
Arroba (dry)	Argentine Republic	25.3175 pounds.
Do	Brazil	32.38 pounds.
Do	Cuba	25.3664 pounds.
Do	Portugal	32.38 pounds.
Do	Spain	25.36 pounds.
Do	Venezuela	25.4024 pounds.
Arroba (liquid)	Cuba, Spain, and Venezuela	4.263 gallons.
Arshine	Russia	28 inches.
Arshine (square)	....do	5.44 square feet.
Artel	Morocco	1.12 pounds.
Barril	Argentine Republic and Mexico	20.0787 gallons.
Barrel	Malta (customs)	11.4 gallons.
Do	Spain (raisins)	100 pounds.
Berkovets	Russia	361.12 pounds.
Bongkal	India	832 grains.
Bouw	Sumatra	7,096.5 square meters.
Bu	Japan	0.1 inch.
Butt (wine)	Spain	140 gallons.
Caffiso	Malta	5.4 gallons.
Candy	India (Bombay)	529 pounds.
Do	India (Madras)	500 pounds.
Cantar	Morocco	113 pounds.
Do	Syria (Damascus)	575 pounds.
Do	Turkey	124.7036 pounds.
Cantaro (cantar)	Malta	175 pounds.
Carga	Mexico and Salvador	300 pounds.
Catty	China	1.333⅓ (1⅓) pounds.
Do[a]	Japan	1.31 pounds.
Do	Java, Siam, and Malacca	1.35 pounds.
Do	Sumatra	2.12 pounds.
Centaro	Central America	4.2631 gallons.
Centner	Bremen and Brunswick	117.5 pounds.
Do	Darmstadt	110.24 pounds.
Do	Denmark and Norway	110.11 pounds.
Do	Nuremberg	112.43 pounds.
Do	Prussia	113.44 pounds.
Do	Sweden	93.7 pounds.
Do	Vienna	123.5 pounds.
Do	Zollverein	110.24 pounds.
Do	Double or metric	220.46 pounds.
Chetvert	Russia	5.7748 bushels.
Chih	China	14 inches.
Coyan	Sarawak	3,098 pounds.
Do	Siam (Koyan)	2,667 pounds.
Cuadra	Argentine Republic	4.2 acres.
Do	Paraguay	78.9 yards.
Do	Paraguay (square)	8.077 square feet.
Do	Uruguay	Nearly 2 acres.
Cubic meter	Metric	35.3 cubic feet.
Cwt. (hundredweight)	British	112 pounds.
Dessiatine	Russia	2.6997 acres.
Do	Spain	1.599 bushels.
Drachme	Greece	Half ounce.
Egyptian weights and measures	(See Consular Reports, No. 144.)	

[a] More frequently called "kin." Among merchants in the treaty ports it equals 1.33⅓ pounds avoirdupois.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Fanega (dry)	Central America	1.5745 bushels.
Do	Chile	2.575 bushels.
Do	Cuba	1.599 bushels.
Do	Mexico	1.54728 bushels.
Do	Morocco	Strike fanega, 70 lbs.: full fanega, 118 lbs.
Do	Uruguay (double)	7.776 bushels.
Do	Uruguay (single)	3.888 bushels.
Do	Venezuela	1.599 bushels.
Fanega (liquid)	Spain	16 gallons.
Feddan	Egypt	1.03 acres.
Frail (raisins)	Spain	50 pounds.
Frasco	Argentine Republic	2.5096 quarts.
Do	Mexico	2.5 quarts.
Frasila	Zanzibar	35 pounds.
Fuder	Luxemburg	264.17 gallons.
Funt	Russia	0.9028 pound.
Garnice	Russian Poland	0.88 gallon.
Gram	Metric	15.432 grains.
Hectare	.....do	2.471 acres.
Hectoliter:		
Dry	.....do	2.838 bushels.
Liquid	.....do	26.417 gallons.
Joch	Austria-Hungary	1.422 acres.
Ken	Japan	6 feet.
Kilogram (kilo)	Metric	2.2046 pounds.
Kilometer	.....do	0.621376 mile.
Klafter	Russia	216 cubic feet.
Koku	Japan	4.9629 bushels.
Korree	Russia	3.5 bushels.
Kwan	Japan	8.28 pounds.
Last	Belgium and Holland	85.134 bushels.
Do	England (dry malt)	82.52 bushels.
Do	Germany	2 metric tons (4,480 lbs.).
Do	Prussia	112.29 bushels.
Do	Russian Poland	11¼ bushels.
Do	Spain (salt)	4,760 pounds.
League (land)	Paraguay	4,633 acres.
Li	China	2,115 feet.
Libra (pound)	Argentine Republic	1.0127 pounds.
Do	Central America	1.043 pounds.
Do	Chile	1.014 pounds.
Do	Cuba	1.0161 pounds.
Do	Mexico	1.01465 pounds.
Do	Peru	1.0143 pounds.
Do	Portugal	1.011 pounds.
Do	Spain	1.0144 pounds.
Do	Uruguay	1.0143 pounds.
Do	Venezuela	1.0161 pounds.
Liter	Metric	1.0567 quarts.
Livre (pound)	Greece	1.1 pounds.
Do	Guiana	1.0791 pounds.
Load	England (timber)	Square, 50 cubic feet; unhewn, 40 cubic feet; inch planks, 600 superficial feet.
Manzana	Costa Rica	1¾ acres.
Do	Nicaragua and Salvador	1.727 acres.
Marc	Bolivia	0.507 pound.
Maund	India	82 2/7 pounds.
Meter	Metric	39.37 inches.
Mil	Denmark	4.68 miles.
Do	Denmark (geographical)	4.61 miles.
Milla	Nicaragua and Honduras	1.1493 miles.
Morgen	Prussia	0.63 acre.
Oke	Egypt	2.7225 pounds.
Do	Greece	2.84 pounds.
Do	Hungary	3.0817 pounds.
Do	Turkey	2.82838 pounds.
Do	Hungary and Wallachia	2.5 pints.
Pic	Egypt	21¼ inches.
Picul	Borneo and Celebes	135.64 pounds.
Do	China, Japan, and Sumatra	133⅓ pounds.
Do	Java	135.1 pounds.
Do	Philippine Islands	137.9 pounds.
Pie	Argentine Republic	0.9478 foot.
Do	Spain	0.91407 foot.
Pik	Turkey	27 9 inches.
Pood	Russia	36.112 pounds.
Pund (pound)	Denmark and Sweden	1.102 pounds.
Quarter	Great Britain	8 252 bushels.
Do	London (coal)	36 bushels.
Quintal	Argentine Republic	101.42 pounds.
Do	Brazil	130 06 pounds.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Quintal	Castile,[a] Chile, Mexico, and Peru	101.41 pounds.
Do	Greece	123.2 pounds.
Do	Newfoundland (fish)	112 pounds.
Do	Paraguay	100 pounds.
Do	Syria	125 pounds.
Do	Metric	220.46 pounds.
Rottle	Palestine	6 pounds.
Do	Syria	5¾ pounds.
Sagene	Russia	7 feet.
Salm	Malta	490 pounds.
Se	Japan	0.02451 acre.
Seer	India	1 pound 13 ounces.
Shaku	Japan	11.9305 inches.
Sho	.....do	1.6 quarts.
Standard (St. Petersburg)	Lumber measure	165 cubic feet.
Stone	British	14 pounds.
Suerte	Uruguay	2,700 cuadras (see cuadra).
Sun	Japan	1.193 inches.
Tael	Cochin China	590.75 grains (troy).
Tan	Japan	0.25 acre.
To	.....do	2 pecks.
Ton	Space measure	40 cubic feet.
Tonde (cereals)	Denmark	3.94783 bushels.
Tondeland	.....do	1.36 acres.
Tsubo	Japan	6 feet square.
Tsun	China	1.41 inches.
Tunna	Sweden	4.5 bushels.
Tunnland	.....do	1.22 acres.
Vara	Argentine Republic	34.1208 inches.
Do	Central America	32.87 inches.
Do	Chile and Peru	33.367 inches.
Do	Cuba	33.384 inches.
Do	Curaçao	33.375 inches.
Do	Mexico	33 inches.
Do	Paraguay	34 inches.
Do	Spain	0.914117 yard.
Do	Venezuela	33.384 inches.
Vedro	Russia	2.707 gallons.
Vergees	Isle of Jersey	71.1 square rods.
Verst	Russia	0.663 mile.
Vlocka	Russian Poland	41.98 acres.

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[a] Although the metric weights are used officially in Spain, the Castile quintal is employed in commerce in the Peninsula and colonies, save in Catalonia; the Catalan quintal equals 91.71 pounds.

METRIC WEIGHTS AND MEASURES.

Metric weights:
- Milligram ($\frac{1}{1000}$ gram) equals 0.0154 grain.
- Centigram ($\frac{1}{100}$ gram) equals 0.1543 grain.
- Decigram ($\frac{1}{10}$ gram) equals 1.5432 grains.
- Gram equals 15.432 grains.
- Decagram (10 grams) equals 0.3527 ounce.
- Hectogram (100 grams) equals 3.5274 ounces.
- Kilogram (1,000 grams) equals 2.2046 pounds.
- Myriagram (10,000 grams) equals 22.046 pounds.
- Quintal (100,000 grams) equals 220.46 pounds.
- Millier or tonnea—ton (1,000,000 grams) equals 2,204.6 pounds.

Metric dry measures:
- Milliliter ($\frac{1}{1000}$ liter) equals 0.061 cubic inch.
- Centiliter ($\frac{1}{100}$ liter) equals 0.6102 cubic inch.
- Deciliter ($\frac{1}{10}$ liter) equals 6.1022 cubic inches.
- Liter equals 0.908 quart.
- Decaliter (10 liters) equals 9.08 quarts.
- Hectoliter (100 liters) equals 2.838 bushels.
- Kiloliter (1,000 liters) equals 1.308 cubic yards.

Metric liquid measures:
- Milliliter ($\frac{1}{1000}$ liter) equals 0.0388 fluid ounce.
- Centiliter ($\frac{1}{100}$ liter) equals 0.338 fluid ounce.
- Deciliter ($\frac{1}{10}$ liter) equals 0.845 gill.
- Liter equals 1.0567 quarts.
- Decaliter (10 liters) equals 2.6418 gallons.
- Hectoliter (100 liters) equals 26.417 gallons.
- Kiloliter (1,000 liters) equals 264.18 gallons.

Metric measures of length:
- Millimeter ($\frac{1}{1000}$ meter) equals 0.0394 inch.
- Centimeter ($\frac{1}{100}$ meter) equals 0.3937 inch.
- Decimeter ($\frac{1}{10}$ meter) equals 3.937 inches.
- Meter equals 39.37 inches.
- Decameter (10 meters) equals 393.7 inches.
- Hectometer (100 meters) equals 328 feet 1 inch.
- Kilometer (1,000 meters) equals 0.62137 mile (3,280 feet 10 inches).
- Myriameter (10,000 meters) equals 6.2137 miles.

Metric surface measures:
- Centare (1 square meter) equals 1,550 square inches.
- Are (100 square meters) equals 119.6 square yards.
- Hectare (10,000 square meters) equals 2.471 acres.

DEPARTMENT INSTRUCTION.

WASHINGTON, *September 26, 1902.*

GENTLEMEN: The Department has been requested by a Massachusetts company to secure, through the good offices of its consular corps, information concerning the manufacture and consumption of briquetted fuel, and to facilitate consular investigation into the subject a series of interrogatories has been submitted, which is hereto appended, the replies to which will cover the information desired.

In submitting his interrogatories, the manager says:

> I believe that the data resulting from this inquiry will be a most important factor in the commercial development of certain sections of the United States, because, without doubt, the commercial greatness of this country is more largely due to the abundance of fuel than to any other one factor.

You will therefore make the necessary investigation into the briquette industry in your districts and forward, as early as practicable, the results of such investigation, which will be published in the Consular Reports.

I am, gentlemen, your obedient servant,

HERBERT H. D. PEIRCE,
Third Assistant Secretary.

The CONSULAR OFFICERS OF THE UNITED STATES
IN CERTAIN COUNTRIES.

1. What amount of briquetted fuel is manufactured and used annually?
2. State material from which briquetted fuels are made, whether coal dust (bituminous or anthracite), lignite, or peat.
3. What is the cost of manufacture? (Including cost of raw material, labor, and interest on money invested in plant.)
4. What is the selling price?

5. State methods of manufacture—something as to the general design of briquetting machines; names and addresses of manufacturers; binding material used, if any; methods of excavating and drying peat and lignite.

6. What is the average capacity per day of the plants? Number of men required to operate the same?

7. Where are the plants located?

8. What methods, processes, or machines are patented?

9. What is the heating value in British thermal units or in comparison with average bituminous coal?

BRIQUETTES AS FUEL IN FOREIGN COUNTRIES.

AUSTRIA-HUNGARY.

TRIESTE.

While the manufacture of briquetted fuel in Austria-Hungary is of comparatively recent origin, it has had so rapid a growth that it bids fair soon to be classed among the important industries of the country. Its remarkable development is attributed to two causes, viz, the comparatively high price of fuel in some parts of the monarchy and the great abundance of waste or inferior coal in others.

Statistical data pertaining to this new industry are so far entirely wanting, and it is impossible to obtain even a fairly reliable estimate of the amount of briquetted fuel manufactured. It may be stated, however, that there is not a single province in the monarchy which does not contain at least half a dozen briquette factories, and in some localities these plants are already as common as flour mills and brickyards.

I have made inquiry of a number of manufacturers concerning the output of their plants, but have in almost every case received an evasive reply. This is only in line with the general reluctance of Austrian merchants and manufacturers to give information concerning their business to outsiders.

Trieste has only one briquette factory. It turns out about 5,000 tons of fuel annually. This amount is rather insignificant for a city of 180,000 inhabitants, but it must be remembered that briquettes are, comparatively speaking, still an innovation here, and that in southern Austria only a very small portion of the people use fuel for any other than cooking purposes.

The principal ingredient of the briquetted fuels manufactured in Austria-Hungary is coal, or rather coal dust or screenings.

In Bohemia, anthracite is mined in large quantities, and briquettes are chiefly made of the refuse of this kind of coal. In the greater portion of Hungary bituminous coal is employed in the manufacturing plants, while in Styria and Bosnia lignite is utilized. In Croatia-Slavonia, as well as in Carinthia and some other parts of this consular district where large quantities of charcoal are produced, charcoal dust has of late also been used in the manufacture of "patent" fuel.

COST OF MANUFACTURE AND PRICES.

The cost of manufacture varies greatly, according to the location of the plant and the kind of material used. Bituminous screenings are of course cheaper than anthracite, and the price of crude labor varies in the different portions of the monarchy from 30 cents to $1 and even more a day. The briquettes made in this city are of the charcoal variety and are produced at a cost of about $10 per ton. The cost of manufacture of lignite briquettes in the province of Styria is said not to exceed $4 per ton, and the owner of a plant at Fiume informs me that he produces, by a process patented by himself, briquetted fuel at about $3.50 per ton.

The selling price of lignite and bituminous briquettes ranges in this consular district from $4.50 to $6.50 per ton, while the charcoal briquettes manufactured at Trieste sell at $12 per ton.

The prices of other fuel for domestic use are as follows: Beach wood, $2 per cubic meter, or about $7 per cord; bituminous coal, from $3 to $6 per ton, according to quality; gas coke, $10 per ton; charcoal, $12 per ton.

METHODS OF MANUFACTURE.

Nearly all the methods of manufacture are of German origin, and Germany still supplies many of the machines used in Austria-Hungary.

The charcoal briquettes manufactured in this city are made in the following manner: The charcoal screenings are first ground fine, after which coal tar is added, and the mixture stirred until it has the proper consistency for pressing. The latter is then molded into egg-shaped pieces weighing, in a dry condition, from 2 to 3 ounces. These pieces are dried in kilns and in the open air.

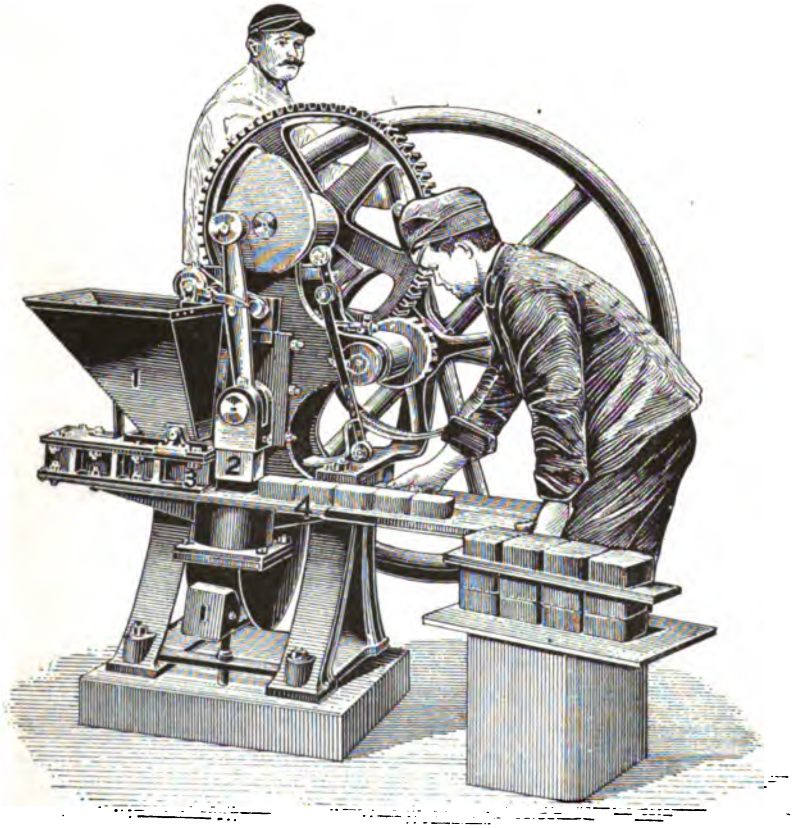
Substantially the same process is employed in the manufacture of lignite and bituminous briquettes. Lignite, however, owing to its low heating power, is seldom used without the addition of from 20 to 30 per cent of anthracite or bituminous coal. This mixture of coal is likewise ground fine, and about 10 per cent of pitch added. The composition, after having been thoroughly blended and partially dried in a kiln having a temperature of from 70° to 80° Celsius (158° to 176° F.), is pressed into bricks weighing about 10 pounds each. The product is then ready for the market.

Until recently, pitch was universally used as a bonding material. Its present high price, however, has led many manufacturers to substitute for it a composition of milk of lime, tar, and "Weisner's patent bonding material" (a solution of sulphuret of lime with free sulphurous acid, resinous substances, and lignine).

The average daily capacity of the Trieste plant, which employs from 20 to 30 men, is from 20 to 30 tons.

Eduard Wiesner & Bro., of Vienna, manufacture a hand machine with a capacity of 8,000 and a power machine with a capacity of 12,000 briquettes per day. This firm also offers to build to order machines capable of turning out upward of 100 tons of briquetted fuel a day.

The principal briquetted-fuel plants in this consular district are located at the following places: Trieste; Gorizia, Litorale; Wöllan, Styria; Trifail, Styria; Gross Ligozna, Bosnia; Dol. Tuzla, Bosnia.



The Wiesner briquette machine.

The briquette machines chiefly in use in southern Austria are manufactured by Eduard Wiesner & Bro., of Vienna, and Ganz & Co., of Budapest. All these machines, as well as the processes of manufacture, are, as far as I am able to learn, protected by patents. The Trieste manufacturer of charcoal briquettes uses a machine and process of his own invention, and has obtained patents on both.

The foregoing is an illustration of a Wiesner machine. Its working is as follows:

The funnel or hopper (1) is filled with the composition to be pressed into briquettes. A turn of the fly wheel causes the plunger (2) to rise.

The sliding apparatus (3), which in the meantime has been filled from the funnel, then passes over the mold and pours its contents into the latter. Another turn of the wheel brings the sliding apparatus back under the funnel, to be refilled. In the meantime the plunger comes down into the mold and sufficiently compresses the contents to form the briquette. The plunger and the bottom of the mold then rise simultaneously until the latter is in line with the base of the sliding apparatus and the pallet placed on the discharging table (4). While the plunger still continues to rise, the sliding apparatus, filled with material, moves over the mold, thereby pushing the finished briquette on the pallet and at the time discharging its contents into the mold, whose movable bottom has in the meantime again dropped down.

The heating value of the various kinds of coal briquettes manufactured in Austria is stated to be as follows:

	Calories.
Anthracite	5,000–6,000
Bituminous	3,500–4,000
Lignite	3,000

The assertion is freely made by the manufacturer of charcoal briquettes in this city that his product has a heating value of from 7,000 to 8,000 calories, but this assertion remains to be substantiated.

FREDK. W. HOSSFELD, *Consul.*

TRIESTE, *January 20, 1903.*

VIENNA.

Until quite recently, briquettes have constituted only a comparatively insignificant item in the household economy of the Viennese. In the course of the past year, however, various enterprising firms, chiefly German, have taken energetic steps to popularize the article, and their efforts have to a certain extent been successful. Of concerns most prominent in organizing the trade, I may mention the "Anker" and "Ilse" factories, both of which have spared neither trouble nor expense to push the sale of briquettes in Vienna and the provinces. By a system of attractive advertising and the opening of offices in the principal streets of the city, they have secured quite a large number of customers. They have, moreover, been favored in some measure by climatic influences, for during the winter there has been unusually cold weather, and a brisk business has been done.

Owing to the relatively short time that has elapsed since the introduction on an extensive scale of briquettes into the country, the statistics dealing with the quantity consumed can only be accepted as approximate. In connection with the two firms above mentioned, however, it is stated that they sell on an average about 200,000 briquettes daily, while the total sales of the other establishments amount to about the same number.

At present the trade, so far as concerns the city of Vienna and its environs, is practically in German hands. In this district, briquette making is virtually nonexistent. Of late, however, plans have been mooted for the erection of briquette works in the neighborhood of the capital, but no definite steps have been taken. In this connection it must be borne in mind that lower Austria is not a coal-producing region, the entire quantity of coal consumed here being brought from mines in Bohemia or other distant parts of the country. Its price at destination is therefore considerably increased by the cost of freight, and under these circumstances it is questionable whether briquettes could be locally manufactured at rates cheap enough to compete with the imported German product.

COST OF PLANT.

In the plans put forward for the erection of a Vienna briquette factory, it is stated that two men and five women would be necessary to serve a press with a productive capacity of 20 tons daily. On this basis, the outlay for wages would amount to, say, about $1.60 per 10 tons. Furthermore, it is asserted that to establish a factory of the size required, a capital of about $24,000 would be needed.

METHOD OF MANUFACTURE.

The briquettes on the market here are made chiefly of bituminous coal dust, and are manufactured by a process involving high pneumatic pressure. A certain quantity of anthracite briquettes is likewise sold by a firm styled Aug. Hochstöger, by whom they are imported from Germany, but the business transacted has been too insignificant to call for special remark.

PRICES.

The retail price at which the common German brown briquettes are sold in this city is $3.20 per 1,000 (about 700 pounds). The black-coal variety dealt in by the above-mentioned firm of Aug. Hochstöger is sold for 64 cents per 100 (about 180 pounds).

BINDING MATERIALS, PATENTS, ETC.

As already stated, the briquettes are manufactured by a hot process and by means of high pressure. A somewhat expensive plant is necessary to carry out the manufacture by this method on a scale large enough to prove profitable. Both the black and brown varieties are produced by an almost identical process, the binding materials consisting of coal tar, pitch, resin, and pretroleum or naphtha refuse. All of these materials, however, are said to possess the disadvantage that in course of combustion, they emit a highly unpleasant odor and generate an undue quantity of smoke.

At least a dozen different patents for briquette-making plants are filed in the archives of the Vienna Patent Office, but practically without exception they presuppose the use of the evil-smelling and smoky binding materials above mentioned. The drawbacks connected with the use of these materials, to which I have referred, are such as to hinder the briquette from gaining general popularity in this country; and, until some process is discovered by which the present objections are removed, it is to be foreseen that the population will remain true to the fuel to which it has been accustomed, and will be slow to accept the briquette as a substitute. Moreover, from inquiries made among the Viennese, I learn that for household heating purposes briquettes are considered expensive, and, so far as warmth is concerned, they can not compete with ordinary anthracite coal. In some respects they are preferred, for the reason that they are cleaner to use and can be handled more easily than common coal; but, on the other hand, the quantity of ash they leave after combustion clogs the stoves, and ultimately the disadvantage outweighs the temporary benefit. Hitherto, the Viennese, attracted by the conspicuous advertisements and notices in the press, have purchased briquettes more or less as an experiment. In most cases, however, it would appear that the trials have not proved a permanent success, for the reasons above mentioned, and gradually a return has been made to the common anthracite coal.

TRADE PROSPECTS.

Judging by investigations I have made, there is a fair prospect of lucrative trade in anthracite briquettes in this district, if they are put on the market at prices lower than those at present demanded for the German product. Furthermore, a new process doing away with the objectionable binding materials now in use would appreciably increase the chances of remunerative business.

At this juncture, the trade is practically a German monopoly; but should improvements be introduced in the manufacturing process and briquettes become generally popular, it may be taken for granted that the necessary capital for the erection of local factories will quickly be forthcoming. Austrian investors are watching the development of events, and should the briquette trade show signs of permanent vitality efforts will be made to compete successfully with foreign trade in this special branch of industry.

Carl Bailey Hurst,
Consul-General.

Vienna, *February 28, 1903.*

PRAGUE.

There are two kinds of coal mined and consumed in this country—black and brown bituminous. The best of the former costs, retail, delivered in this city, 2.60 crowns (52 cents) per 100 kilograms (220.46 pounds) and the latter about 1.50 crowns (30 cents). The briquettes are made exclusively of brown coal.

The cost of production, including raw material, labor, and interest on the capital invested in the plant, is from 70 to 76 hellers (14 to 16 cents) per 100 kilograms (220.46 pounds).

The selling price is at present from 124 to 128 crowns ($25.17 to $25.98) per 10,000 kilograms (22,046 pounds), the retail price at the mine being 1.36 crowns ($0.276) per 100 kilograms (220.46 pounds).

In manufacturing the briquettes, the brown coal is ground in the factory, dried, and then molded into blocks by press machines, no bonding material being used.

The briquetting machinery is principally made at Buckau, near Magdeburg, Germany, by the Buckauer Maschinenfabrik. The average daily capacity of the plant is 24 carloads of 10,000 kilograms each, or 240,000 kilograms (264.5 tons).

No part of the machinery or process is patented except the apparatus for drying.

The heating value of the briquettes produced by the plant is from 5,222 to 5,843 calories.

ETHELBERT WATTS, *Consul.*

PRAGUE, *December 15, 1902.*

REICHENBERG.

The Bohemian briquette industry is of comparatively small proportion, only two factories being in present operation, viz, that of C. Melhardt, in Wesseln, near Aussig, and the Konigsberg factory, near Eger. The annual output is about 100,000 tons. The Schadowitzer Steinkolenwerke have factories at Schadowitz and Libuschin, but these have been closed for a long period for reasons not made public. A project is pending for the establishment of another press at Mantau, in southern Bohemia. Bohemian briquette manufacture appears to be an offshoot of the German industry, processes being borrowed and adapted to local conditions and to the character of the raw material—just such an application of method as it would seem must eventually be made in the United States. These processes in general have been described and the economic phases of the subject treated in the reports of Consul-General Mason, of Berlin, and repetition is unnecessary; but here in Bohemia a perfected development along one line of experiment appears to be attained that is yet novel and must prove of decided interest to American householders, as well as to the producers of bituminous fuel of whatever character. This is the production of a briquetted fuel, dustless, more or less smokeless according to formula of composition, and of such durability and caloric value as to be a practical substitute for anthracite in the American base-burner, the hot-air furnace, and the boilers of steam plants where fuel of such a character is the first desideratum. Of equivalent importance is the fact that the basic material of this briquetted fuel is bituminous slack—the waste of soft coal,—the finished product being marketed at rates even slightly lower than those charged for lump coal of the best quality from the same mines. By the admixture of coke in varying quantities a more nearly perfect fuel is produced by the same machinery, reaching to the results attained in Herr Melhardt's "Kaumacit" briquettes—an apparent substitute for anthracite for general uses. No peat briquettes are manufactured here.

LIGNITE BRIQUETTES.

The coal fields of Bohemia produce chiefly what is locally termed "brown coal," really a lignite much resembling that found distributed through portions of the Dakotas, Montana, and other Western States. In its natural state it is of low caloric value and of imperfect combustion, producing much smoke. In prosecuting inquiries, I was informed by the Handels- und Gewerbekammer, the official chamber of commerce for this district, that brown coal is not at all suited for briquettes, on account of its low percentage of bitumen. The value of this statement appears to lie in its application, for the fact that brown coal is certainly the poorest local material for briquettes does not disturb the general proposition that all similar raw fuels are improved in utility and their caloric value and durability under combustion increased by the concentration which gives the chief value to briquettes. Thus, even the briquettes made from almost worthless waste of brown-coal mines reach a market value greater than that of the best brown lump, and while this ratio of economic value is not fully maintained when the briquette base is of the higher grades of bituminous and carbonized coal, it is approximately.

A comparatively small proportion of the Bohemian coal product is what, on account of its superiority to and hardness over the brown coal, is called "stone coal." It is also slightly brownish in color and friable, but burns freely and cleanly, and in general qualities corresponds to the average soft coal of America. The German coal of similar kind is said to be superior, and is very largely imported for household use. The word anthracite is locally applied to the best quality of imported bituminous coal, resembling the cannel coal of Pennsylvania and the lower-vein coal of Illinois and Iowa, and the current use of the word here, at least, does not imply a genuine anthracite. Official estimates place the total output of coal from the northern Bohemian mines for 1902 at 18,250,000 tons, 1,500,000 tons less than in 1901, and the exports at 7,000,000 tons, 600,000 tons less than the preceding year.

The Königsberg factory above mentioned uses brown coal without admixture in manufacturing briquettes, securing an average price of about 1.25 crowns per 100 kilos ($0.25 per 220.46 pounds). This is the ordinary process, and simply by pressure converts brown coal slack and small coal into bricks[a] of a marketable fuel of concentrated caloric value as compared with the raw material.

It is to the Melhardt processes and results that attention is directed. He conducts large works for the manufacture of lighting and power gas, coke, and chemical by-products, and his experiments in the manufacture of briquettes has covered much of the ground that would otherwise have to be traversed by American imitators. His processes and machinery are protected by patents, and the machinery has been largely constructed after his own specifications. It is claimed that his products are not duplicated in Germany or elsewhere. Both processes and machinery, he affirms, can be applied with complete success to the conversion of small bituminous coal in America into clean briquettes suitable for base-burning stoves and furnaces, which could be retailed at a price approximating that of the best lump coal from the same mines. By proper admixture of coke and binding ingredients, the product can be given any desired degree of smokelessness at comparatively small increase of cost. The size and shape of the briquettes are matters of mechanism. His products are a staple on the general market, and from his demonstrated success it is easy to believe that his methods, practically applied throughout the soft-coal regions of America, would not only provide a profitable market for slack and small coal, but also give consumers a decided relief from the scarcity and high prices of anthracite. The relative cost of raw coal and briquettes made from it, at present current prices in Bohemia, can be measured from the following table, quotations being on lots of 10 tons (2,204.6 pounds to the ton):

Class.	Austrian currency.	United States currency.
	Crowns.	
1. Best Bohemian brown lump coal	100	$20.30
Dust and small coal	5	1.015
Briquettes from latter	160-180	32.00-36.54
2. Best lump stone coal	200	40.60
Dust and small coal	12	2.44
Briquettes from latter	180	36.54
	Marks.	
3. Best German stone coal	180	42.84
Dust and small coal	90	21.42
Briquettes from latter	150	35.70
4. Anthracite, imported nut size	360	85.68
Dust and small coal	100	23.80
Briquettes from latter	300	71.04

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[a] Samples of which have been filed for reference in the Bureau of Foreign Commerce.

This table covers all grades of coal, local and imported, and briquettes made therefrom.

In considering the cost of manufacture, the element of labor should not be overlooked. American wages for workmen of a similar class will average double those paid in Bohemia, but the institution of improvements and economies in method might not unreasonably be expected to minimize if not entirely obliterate this difference.

COKE BRIQUETTES.

The "Kaumacit" briquette[a] manufactured by Herr Melhardt is a specialized smokeless product composed chiefly of coke and is of convenient size for stove or steam purposes. Its particular ingredients and their method of combination and manufacture are secret. It retails at a minimum price of 2.50 crowns per 100 kilos ($0.507 per 220.46 pounds). It has received severe tests at Vienna and by Engineer Haage of the boiler inspection service of Saxony. At a test made at the Berlin electric works it was also used as a mixture in varying proportions with upper Silesian coal in a search for a smoke remedy, the results not only being satisfactory as to smoke but also effecting, through more nearly perfect combustion, a greater heat efficiency from the coal itself.

Next below the "Kaumacit" in grade of Herr Melhardt's mixed specialties is a briquette known on the market as the "Dauerbrand-brikett Marke Kraft,"[a] and designed especially for German heating stoves. It is composed of certain percentages of both coke and coal, with binding material, and retails for $0.406 per 220.46 pounds. The German stove is an iron fire-pot and radiator of simple construction, surrounded by a tile structure to retain the heat. The feeding and ash doors, air tight, are closed when the fuel reaches an incandescent state, and thus all direct draft is shut off, while the gases are free to escape. For the "Kaumacit," the inventor claims that one stoking of 22 pounds will, in such a stove, retain fire for twenty-four hours, maintaining in an ordinary room a temperature of 20° C. (68° F.) with an outside temperature of −16° C. (2° F.), a result not to be obtained with less than 88 pounds of the best raw coal and four stokings. For the "Marke Kraft," the proportionate value of three to one is claimed, and in both instances the result is said to be largely due to the conditionated burning effected by the combination of materials.

Herr Melhardt offers to answer practical inquiries, which should be made in German.

S. C. McFarland, *Consul.*

Reichenberg, *February 3, 1903.*

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[a] Samples of which have been filed for reference in Bureau of Foreign Commerce.

BELGIUM.

BRUSSELS.

The latest available official statistics concerning briquetted fuel in Belgium cover 1901. They show that there were in this consular district at that time 30 plants engaged in the manufacture of various kinds of briquettes, distributed as follows: Twenty-seven plants in the province of Hainaut, with a total of 60 presses and employing 1,237 workmen, and 3 plants in the province of Namur, with 10 presses and employing 83 workmen.

The amount of coal consumed in the province of Hainaut was 1,130,460 tons, from which were produced 1,236,450 tons of briquettes, valued at 23,876,000 francs ($4,608,068), or 19.31 francs ($3.726) per ton. As compared with 1900, the production shows an increase, while the average price per ton, although 4.52 francs ($0.872) less than that of the preceding year, still remained high. The following tabulated statement shows the annual production and the average price per ton of briquettes in the province of Hainaut during the last five years:

Year.	Production.	Average price per ton.	
		Belgian currency.	United States currency.
	Tons.	*Francs.*	
1897	1,030,330	12.51	$2.413
1898	1,119,180	13.40	2.586
1899	1,023,290	16.21	3.128
1900	1,091,150	23.83	4.599
1901	1,236,450	19.31	3.726

BRIQUETTE OUTPUT IN THE PROVINCE OF NAMUR.

The 3 plants in the province of Namur, which comprise a total of 10 presses, employ 83 workmen, and make coal and pitch briquettes, consumed, during the year 1901, 94,790 tons of coal in the production of 105,870 tons of briquettes, valued at 1,989,250 francs ($383,915.25), or 18.79 francs ($3.626) per ton. The output for the year shows a decrease of 2,100 tons as compared with that of 1900. The value also fell from 2,529,350 francs ($488,166.55) to 1,989,250 francs ($383,925.25), or 540,100 francs ($104,239.30).

The average selling price per ton was reduced from 23.43 francs ($4.521) to 18.79 francs ($3.626). A few small plants that do not employ pitch in the manufacture of briquettes are not incorporated in official statistics.

The following table shows the production and average price per ton for briquettes in the province of Namur during the last five years:

Year.	Production.	Total value of production.		Average price per ton.		Number of workmen.
		Belgian currency.	United States currency.	Belgian currency.	United States currency.	
	Tons.	*Francs.*		*Francs.*		
1897	47,120	589,600	$113,823.80	12.51	$2.414	45
1898	70,990	913,800	176,363.40	12.87	2.483	49
1899	89,070	1,379,750	266,260.75	15.34	2.960	53
1900	107,970	2,529,350	488,164.55	23.43	4.521	64
1901	105,870	1,989,250	383,925.25	18.79	3.625	83

Exportation of briquettes from the province of Namur during the year 1901.

Country.	Tons.	Price per ton to frontier.	
		Belgian currency.	United States currency.
		Francs.	
France	33,320	22.79	$4.398
Germany	9,115	23.17	4.471
Grand Duchy of Luxemburg	4,270	19.60	3.782
Holland	1,940	24.18	4.666
Switzerland	3,600	21.78	4.203
Other countries	12,050	20.66	3.967
Total	64,295		
Average price		22	4.246

Importation and exportation of briquettes to and from Belgium during the year 1901.

Country.	Imports.	Exports.	Country.	Imports.	Exports.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Argentine Republic		4,350	Japan		700
Chile		2,852	Portugal		3,755
China		5,900	Russia		3,560
Kongo Free State		9,920	Spain		33,981
Egypt		2,050	Switzerland		18,697
England	152	6,975	Tunis, Africa		2,000
France	897	449,538	Turkey		4,650
Germany	15,878	44,327	United States		81,915
Grand Duchy of Luxemburg		23,987	Other countries	24	6,961
Greece		1,300			
Holland	209	9,057	Total	17,160	714,455
Italy		2,980			

COMPONENT MATERIAL.

Materials from which briquettes are made vary according to the use for which the fuel is destined. When manufactured for railroad consumption, generators, power plants, etc., about 90 per cent of bituminous coal is used, to which is added mineral pitch or coal tar. The mixture varies according to the nature of the coal employed, whether ruddy, close, or half free-burning coal. The paste contains from 13 to 14 per cent of water. When intended for domestic use, about 30 per cent of clay or marl is added. Briquettes of an inferior quality are made from a mixture of sawdust, tannery and brewery residue, peat, turf, and lignite.

COST OF MANUFACTURE.

The estimated cost of manufacture, including raw material, labor, and interest on money invested, is about 17 francs ($3.281) per ton, divided as follows: Ninety per cent coal, 8.50 francs ($1.64); 10 per cent tar, pitch, or resin, 6.50 francs ($1.25); labor and interest on money invested in plant, 2 francs ($0.386).

SELLING PRICE.

The average selling price for good quality briquettes varies, according to condition of contract and destination, from 18 francs ($3.474) to 20 francs ($3.86) per ton. For example, a recent contract was made by this Government with an establishment at Charleroi for a large quantity of briquettes, to be delivered to purchaser at works, at 18 francs ($3.474) per ton.

METHOD OF MANUFACTURE.

DESCRIPTION OF PLANT FOR SEPARATING, WASHING, AND MAKING COAL BRIQUETTES.

This plant (see illustrations on following pages) can work up 500 tons of coal in ten hours.

The work is divided as follows: To sort 300 tons of coal; to wash 150 tons; to make from 120 to 150 tons of briquettes weighing 5 kilos (11 pounds) and 50 tons of ovoid balls of 150 grams (5.289 ounces).

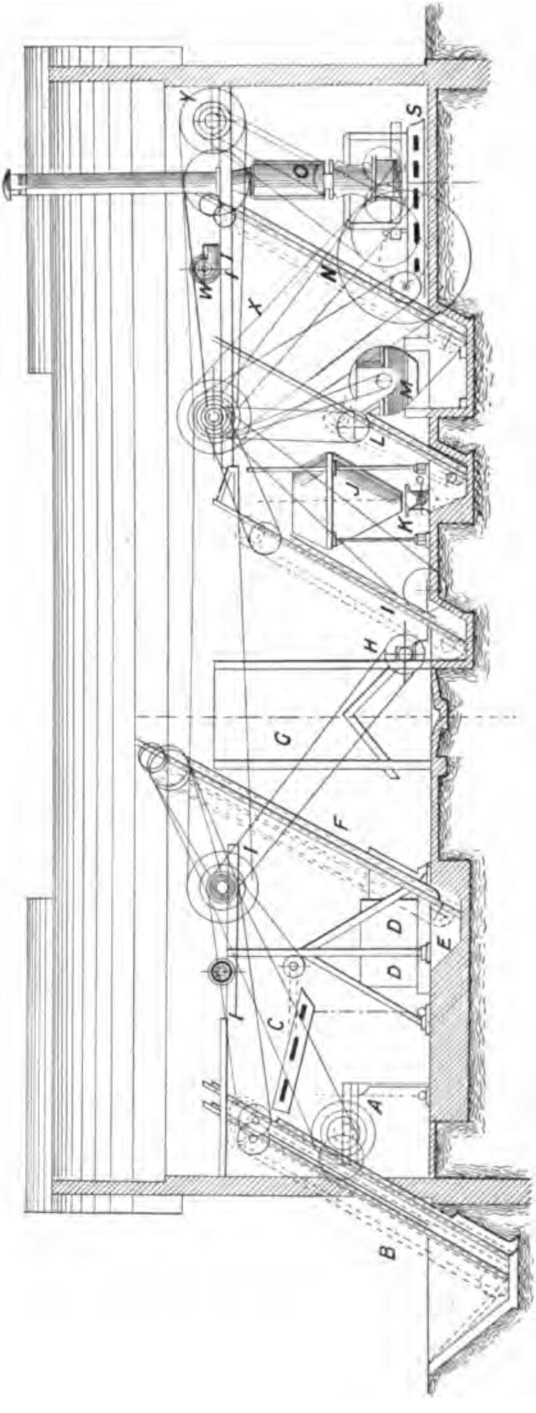
A. Separating drum. B. Endless-chain bucket. C. Oscillating table. D. Coal-washing tubs. E. Tank (or absorbing well). F. Bucket chains. G. Drainpipes. H. Forcing screw. I. Bucket chain. J. Recipient. K. Proportional distributer of pitch and coal. L. Bucket chain. M. Carr grinder. N. Bucket chain. O. Pug mill and distributer. Q. Ball press. R. Distributer. S. Briquette press. T. Cutting table. U. Steam heater. V. Steam engine. W. Ventilator. X. Beams and columns. Y. General transmission.

Coals arrive at 70 and pass through the separating drum A, which separates it into three categories, 70–40, 40–25, and 25–0.

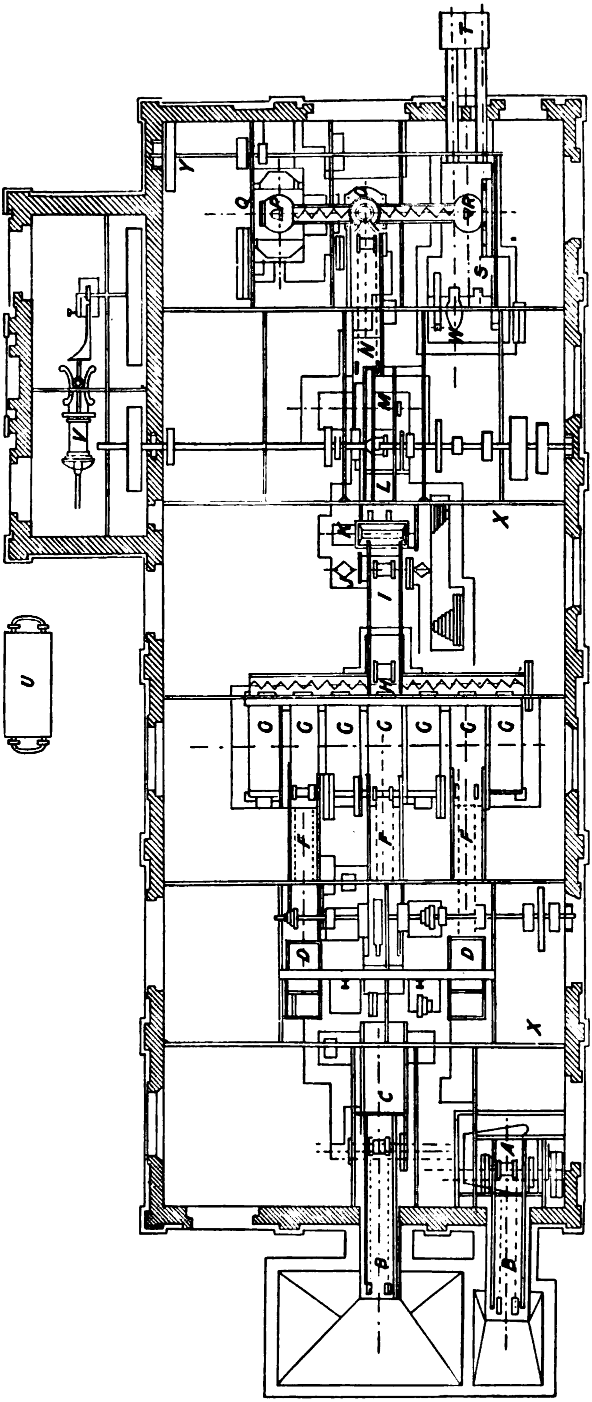
The 70–40 and 40–25 are put aside for sale. The 25–0 are passed into the tank by means of the endless-chain buckets B, from which they pass to the oscillating table or sifter C, which separates them again into three different kinds, 25–12, 12–6, and 6–0.

The 25–12 and 12–6 are carried to the washing tank D. After washing, the 25–12 and 12–6 are removed to tank E by the endless-chain buckets J, which hoist them to the draining tower G. The 6–0 is also hoisted by a movable bucket to a storing tower.

A forcing screw H, working at the foot of the towers, removes the washed coal, when sufficiently drained, from either tower and permits the reclassing of the three kinds of coal. It is easy to see that this arrangement permits the manufacture, according to the requirements



Elevation of machine.



Ensemble of machine for sorting, washing, and making briquetted fuel, working 500 tons of coal in ten hours. Price, 8,000 francs. ($1,544).

of purchaser, of three different sorts—unwashed, mixed, or thoroughly washed. The coal is then carried into the tank of the endless-chain buckets I, which hoists it into the recipient J. Under the recipient J is the proportional distributer of pitch and coal K. It is by this distributer that exact division of pitch and coal is made. The mixture is then carried to the Carr pug mill M by endless-chain buckets L. The Carr pug mill is considered to be a perfect mixing machine and at the same time an excellent grinding machine. An endless-chain bucket N then hoists the matter to the mixing machine O, where it is transformed by the action of steam into a cohesive paste.

This paste runs out through two openings placed on the right and left sides of the pug mill. Two forcing screws specially disposed for cooling the paste take it to distributer P of the balls press Q on one side, and to distributer R of the briquettes press S on the other.

The briquettes as they issue from the molds are taken to the cutting table T by means of two irons U, and separated by hand, and then, according to circumstances, are stored or delivered.

DOUBLE PRESS FOR BRIQUETTES, PRODUCING 15 TONS PER HOUR.

Among all the systems of presses for briquettes employed up to date for agglomerating coal, two types have remained in use, the press with closed molds and the press with open molds (see illustrations on next page). The latter is more generally used, as it works with washed coals containing up to 20 per cent of water and gives a big production (15 tons per hour). Its construction is simple and solid, it is easy to work, and costs practically nothing to keep in good order. The ordinary compression is 100 kilos (220 pounds) to 120 kilos (264 pounds) per square centimeter; the cohesion reaches from 65 to 70 per cent, while the railway companies in their contracts call for a cohesion of only 50 per cent.

DOUBLE PRESS FOR BALLS MAKING 5 TONS PER HOUR.

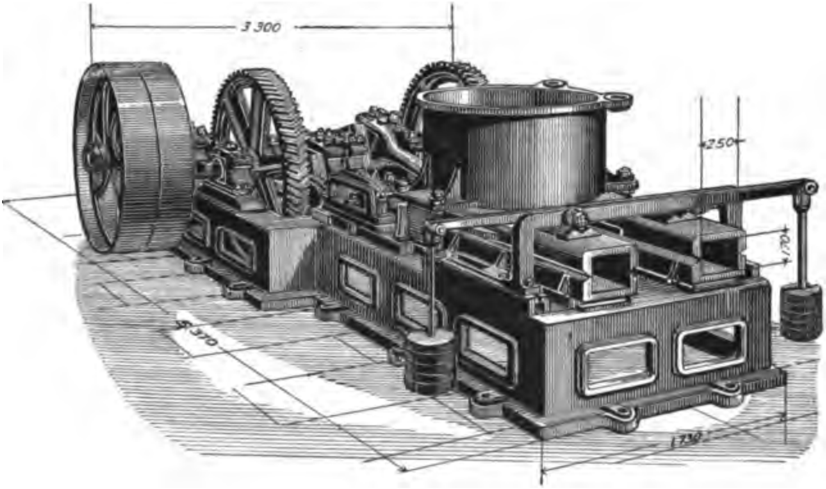
The press for ovoid balls is composed of four tangential wheels. The number of cavities in each wheel is 96 and the normal velocity of wheels is 2½ revolutions per minute. The production of such a press with two rows amounts to 5 tons per hour. The weight of balls may be changed from 140 to 180 grams (4.9 to 6.3 ounces).

The weight of this press is 10,400 kilos (22,928 pounds). Similar presses with three rows of molds are also constructed and give a production of 7½ tons per hour.

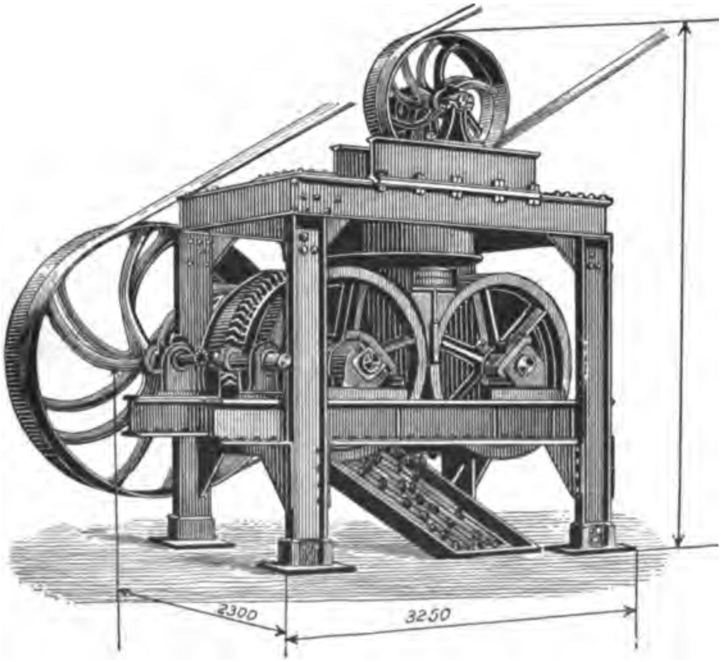
By this method, which requires very little care, a fuel is produced that is preferable to briquettes, especially for domestic stoves. There is no waste; the oval shape and great compression permits rough handling. The balls take up little room and may be thrown into ship's hold without fear of deterioration. The mixture is the same as for briquettes, viz, 5 to 10 per cent pitch, according to qualities of coal.

AVERAGE CAPACITY PER DAY OF PLANTS.

The average capacity per day of plants depends entirely upon the number of machines in use. In some plants, not more than 6,500 briquettes are made per day of ten hours, while in more elaborately equipped establishments, 30,000 briquettes are turned out in the same



Double press for briquettes. Production, 15 tons per hour. Price, 8,000 francs ($1,544).



Double press for balls. Production, 5 tons per hour. Price, 8,000 francs ($1,544).

number of hours. Plants are usually equipped as follows: Steam generators; 1 motor machine; 1 coal crusher (in some cases useless) or drier; 1 resin crusher or boiler for melting resin; resin and coal measure for measuring mixture; heating and mixing machine; mixing machine; occasionally an endless cloth for cooling, transporting, and loading the briquettes.

To work an ordinary briquette machine, the number of hands required and the wages paid per day are the following:

For—	Belgian currency.	United States currency.
	Francs.	
One foreman operating machine	5	$0.965
One stoker	4.50	.868
One overseer	4	.772
Two mixers, each 3.50 francs	7	1.351
Two carriers, each 3.50 francs	7	1.351
Three boys for loading briquettes on wagons or cars, each 2 francs	6	1.158
One boy for washing and crushing resin	2	.386
Total	35.50	6.851
Keeping in repair.		
Oils, packings, etc	5.50	1.061
Fuel, 900 kilos at 20 francs per ton	18	3.474
Total	23.50	4.535
Material.		
Washed coal dust, 25.3 tons at 8.12 francs	205.43	39.647
Pitch resin (7 per cent), 1,957 kilos at 75.75 francs	148.17	28.596
Tar (25 per cent), 699 kilos at 60 francs	41.95	8.096
Total	395.55	76.339
Grand total	454.55	87.725

LOCATION OF PLANTS.

As before stated, excepting three plants in the province of Namur, the majority of briquette manufactories in this district are located at or near Charleroi, Belgium. They are as follows:

L. Kieg-Richard, Braine-le-Comte, Hainaut.
Société Anonyme des Agglomérés réunis du bassin de Charleroi, Charleroi.
Société des Charbonnages de Sacré Madame, Charleroi.
Honillères-Unies du bassin de Charleroi, Gilly, Hainaut.
L. Waltin, Route de Philippeville, Charleroi.
Société Anonyme du Charbonnage d'Ormont, Châtelet.
Société du Charbonnage de Banbier, Châtelet.
Société Anonyme des Charbonnage d'Aiseam Cresles, Châtelinean.
Société Anonyme des Charbonnages des Trien-Kaisin, Châtelinean.
Société Anonyme des Charbonnages de Noël-sart-Culpart, Gilly.
Alb. Dehaynin & Co., Marchinne-au-Pont, Hainaut.
Société Anonyme des Charbonnages de Monceean-Fontaine et du Martinet, Moncean-sur-Sambre.
Société Anonyme des Charbonnages de Ressaix, Ressaix.
Société Anonyme des Charbonnages de Ham-sur-Sambre, et Monstier, Ham-sur-Sambre, Namur.
Stassin & Co., Auvelais Namur.

The above plants are the most important in this district.

HEATING VALUE.

The heating value of briquettes depends entirely upon their component parts. Briquettes of 90 per cent coal mixed with tar or pitch have a heating power about 10 per cent greater than the coal from which they are made. The calorific value per briquette is estimated at 7,500 calories, or in British thermol anits, 30,000.

The pitch employed in briquetted fuel in this country is chiefly imported from England.

The leading makers of briquette machines in this district are: Joseph Legrand, at Brussels; A. Robert (specialist), at Gilly; Allard Frères, at Châtelinean, Belgium.

GEO. W. ROOSEVELT, *Consul.*

BRUSSELS, *December 12, 1902.*

CHARLEROI.

The production of briquetted fuel in the province of Hainaut was, in 1901, 1,240,000 tons of 2,205 pounds, being the output of 27 factories. The average price was 19.30 francs ($3.72) per ton. In the province of Namur, the factories produced 106,000 tons, valued at 18.80 francs ($3.62) per ton. The briquettes were principally consumed in power plants, steel and iron foundries, and glass works producing other than window glass. Apart from the consumption within the zone of production, Antwerp receives great quantities of this fuel for steamships coaling there.

MATERIAL USED.

The briquettes are made from a mixture of coal and the residue of distilled tar, the coal containing 12 to 15 per cent of volatile matter and the tar pitch 50 to 55 per cent. In the absence of coal containing the requisite percentage of volatile matter, different kinds of coal are mixed to secure the proper volatility. The tar pitch used is, for the most part, imported from England, unsuccessful efforts having been made to procure it in the United States at a price which would meet English competition.

COST OF MANUFACTURE.

The cost of manufacture of the briquettes per ton, say 17 francs ($3.50), is distributed as follows: Ninety per cent coal dust=8.50 francs ($1.65); 10 per cent tar pitch=6.50 francs ($1.26); labor and interest on money invested in plant=2 francs ($0.39).

PRICE.

The Belgian Government recently bought a large quantity of this fuel (to be delivered to buyer at works) for 18 francs ($3.47) per ton.

The price of briquettes of good quality fluctuates between 18 francs ($3.47) and 20 francs ($3.90) per ton. At this writing it is something over 19 francs ($3.67).

METHODS OF MANUFACTURE.

There are two systems for the making of briquettes in this district, the preliminary process being the same in each case. This preliminary process consists of crushing the coal, washing it, and then drying it centrifugally, by dripping, or by heating on a platform (Tigler system). In the last two cases blowers are also used. The coal thus prepared is mixed with tar pitch, which has been previously pulverized in a Carr crusher. The whole is then reduced to dust, after which it enters a rotary mixer, where it is heated by superheated steam at 300° C. and under a pressure of 8 atmospheres. The resulting paste passes through a cooler and thence to the distributer by which the molds are fed. It is in the molds that the two systems of briquette making differ. Molds are either of the open or closed type. The open-mold method of briquette compression, stated simply, has for its elements a pipe whose cross section is, in shape and size, that of the "face" of the briquette and a piston which fits one end of the pipe or mold, the other end being open. When a sufficient amount of "paste" has been placed by the distributer between the piston and the previous briquette pressed, the piston moves forward and presses a new briquette, at the same time forcing a finished briquette from the open end of the pipe or mold. The pressure exerted by the piston in this method of briquette pressing is naturally not very great, being dependent upon the friction of completed briquettes against the walls of the mold and the length of the mold. To increase the pressure the mold is sometimes tapered from the piston to the open end. Notwithstanding the difficulty of securing a desirable pressure in this type of mold, it is the one most in use, having the counterbalancing advantage of rapid production of briquettes which the closed-mold method lacks. Open molds are generally fitted up in pairs on the Bouriez continual-motion system.

The closed-mold method consists of a revolving table with cavities in it the shape of the briquette, but greater in depth than the briquette's least dimension. These cavities, filled with the "paste" by the distributer, pass in rotation under a hydraulic press, the bricks thus formed being immediately afterwards ejected automatically.

The following firms make briquette machinery, patented and otherwise. A great many patents exist that are important in a minor way.

Ateliers de Nicolaïeff at Bouffioulx.
Ateliers de Boussu at Boussu.
Société Anonyme de Marcinelle et Couillet, at Couillet.
Ateliers de l'Est at Marchienne.
Société des Usines de Gilly (Robert), at Gilly.

The company last mentioned holds perhaps the most important place among the makers of briquette machinery, and controls the more valuable patents.

AVERAGE CAPACITY OF PLANTS.

Open molds fitted in pairs (there is generally only one pair of molds to each factory), have a capacity of from 200 to 300 tons per day of twenty-four hours; any production over 300 tons is exceptional. There is no criterion as to the number of men employed in any given plant, but the process of brickmaking with a pair of molds, it would be safe to say, requires the attention of at least 12 men.

LOCATION OF PLANTS.

The following is a partial list of the briquette-making plants in Hainaut. These plants are generally affiliated with mining companies, on account of coal supply and economy in hauling:

Charbonnages Monceau-Fontaine.
Charbonnages Monceau-Bayemont.
Charbonnages Courcelles-Nord.
Charbonnages Ressaix.
Charbonnages Marcinelle-Nord.
Charbonnages Sacré-Madame.
Charbonnages Boubier.
Charbonnages Houssu.
Charbonnages Mariemont.
Charbonnages Réunis.
Charbonnages Tamines.
Charbonnages Haldy Fréres.
Usine de Briquettes du Nord.
Usine de Briquettes Aissau-Pesle.
Uisine de Briquettes Houillères Unis.
Usine de Briquettes Trieu-Kasin.
Agglomérés Réunis du Bassin de Charleroi.
Agglomérés Réunis de Châtlineau.

HEATING VALUE.

Bricks have a heating power of about 10 per cent greater than that of the coal from which they are made. The calorific value depends naturally upon the coal used and the density of the brick. Bricks that are made from unwashed or partly washed coal have less heating power and more ash. Roughly, the calorific value per brick may be set at 7,500 calories, or, in British thermal units, 30,000. Good bricks have from 6 to 10 per cent ash and from 7 to 10 per cent volatile matter.

Albert H. Michaelson,
Consular Agent.

Charleroi, *November 26, 1902.*

GHENT.

Neither coal nor peat is found in this part of Belgium, nor are there any forests from which wood can be cut for fuel. The ordinary bituminous coal in its natural state is the fuel almost exclusively used. Most of this coal is mined in the Walloon district, where are also located manufactories of briquetted fuel. There are no plants in this

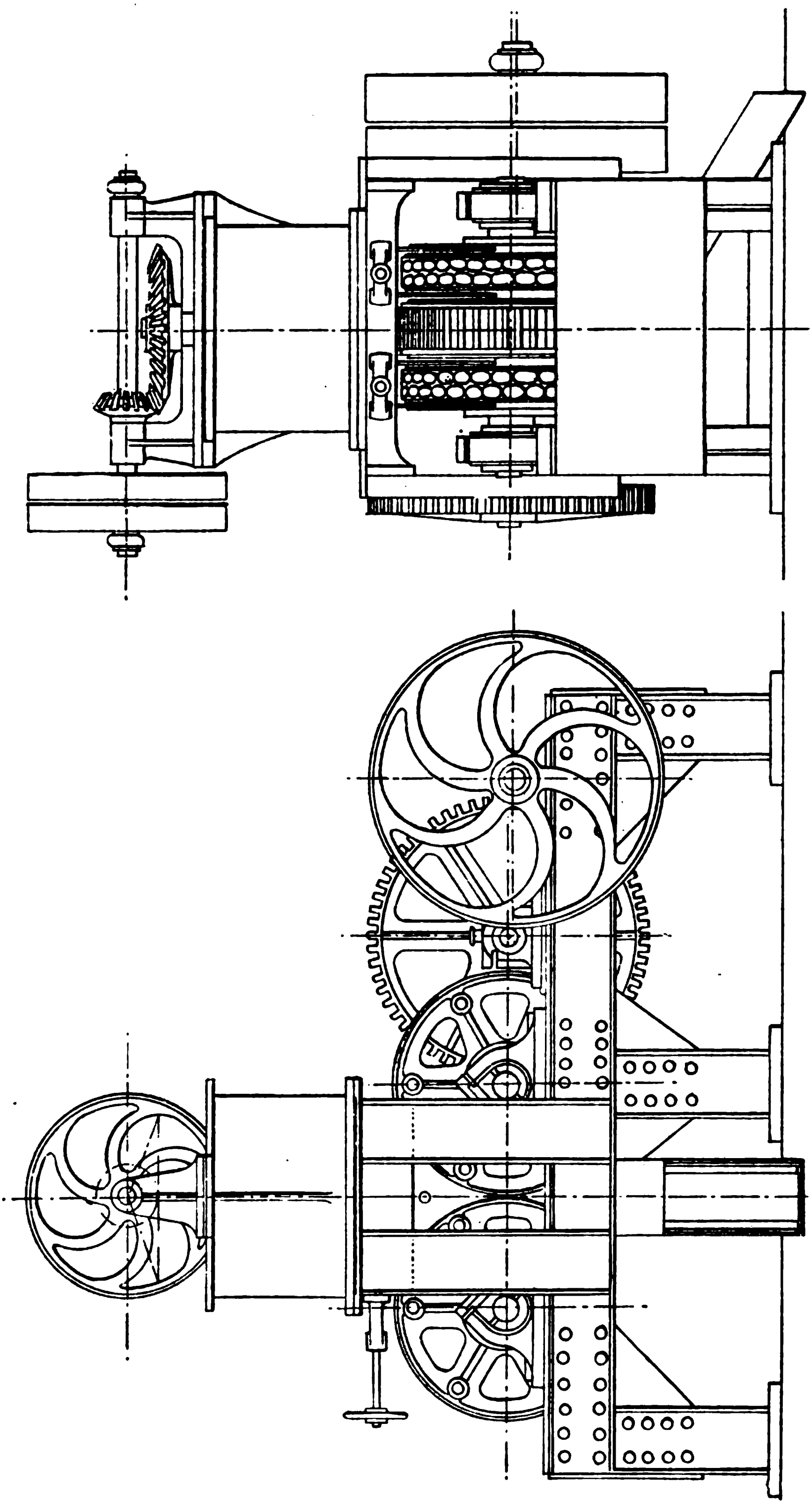


Fig. 1.

vicinity that produce either briquetting machinery or the briquettes themselves.

Briquetted fuel is offered for sale by all coal dealers, but is not generally used because it burns too slowly, except with a forced draft. It seems well adapted to the requirements of nurserymen for heating their greenhouses. It is also burned on some of the railroad locomotives and the channel steamers plying between Ostend and Dover. It is estimated that approximately 30,000 tons are consumed annually in the two Flanders. Bituminous coal ranges in price from 25 francs ($4.83) to 30 francs ($5.70) per 1,000 kilos (2,200 pounds); briquetted fuel is sold at retail from 15 francs ($2.85) to 17 francs ($3.28) per 1,000 kilos.

FRANK R. MOWRER, *Consul.*

GHENT, *December 27, 1902.*

LIEGE.

The briquetted fuel manufactured and used in Belgium amounts to about 1,500,000 tons.

The greater part is made of resin (brai) and anthracite coal dust.

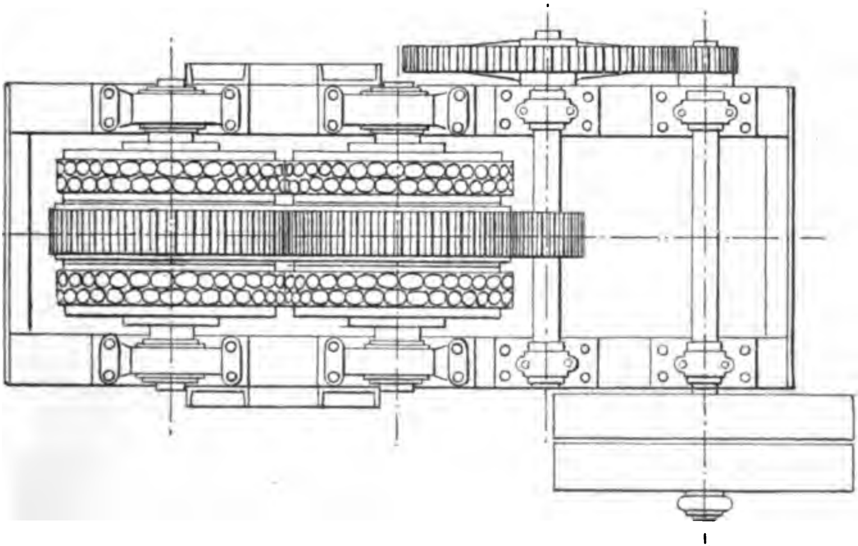


FIG. 2.

Bituminous coal gives too much smoke, and briquettes of this material are used only on board steam vessels, while anthracite coal briquettes are burned in numerous industrial plants.

The cost of manufacture is about 4 francs ($0.80) a ton.

The selling price is from 14 to 21 francs ($2.70 to $4) a ton.

In manufacturing, the coal is washed and then heated and mixed with the resin by means of mechanical mixers.

The machines used are the following:

(*a*) Press for ovoid bullets. (See figs. 1 and 2, pages 38 and 39.)

(*b*) The Couffinhal press (Presse Couffinhal) for industrial and domestic briquettes, is a closed mold with double compression. (Fig. 3.)

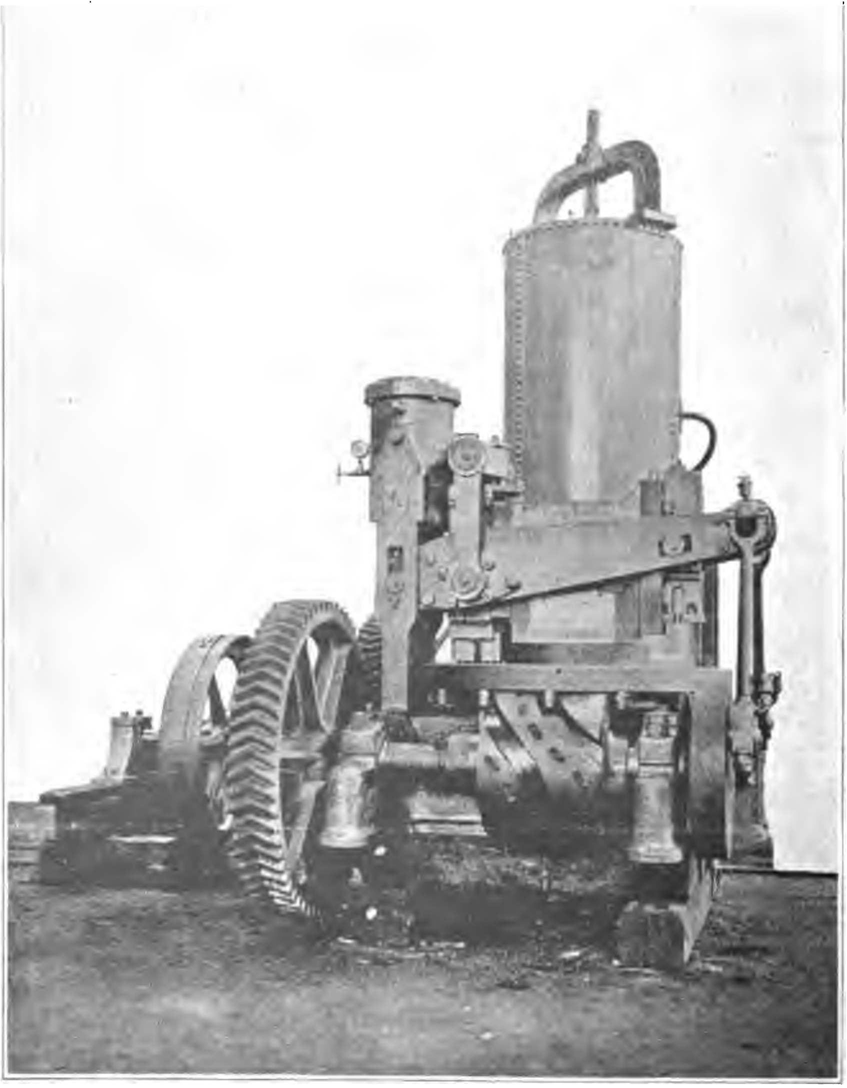


Fig. 3.

(*c*) The Bourriez press (Presse Bourriez), called the open mold press, for industrial and domestic briquettes, is an open mold with single compression. (Fig. 4.)

The ovoid bullet press in ten hours permits the manufacture of 40 to 50 tons of ovoid bullets weighing up to 160 grams (5.6 oz.) a piece.

It weighs about 11,000 kilograms (24,250.6 lbs.) and costs from 9,000 to 10,500 francs ($1,800 to $2,000) f. o. b. car, according to the different types.

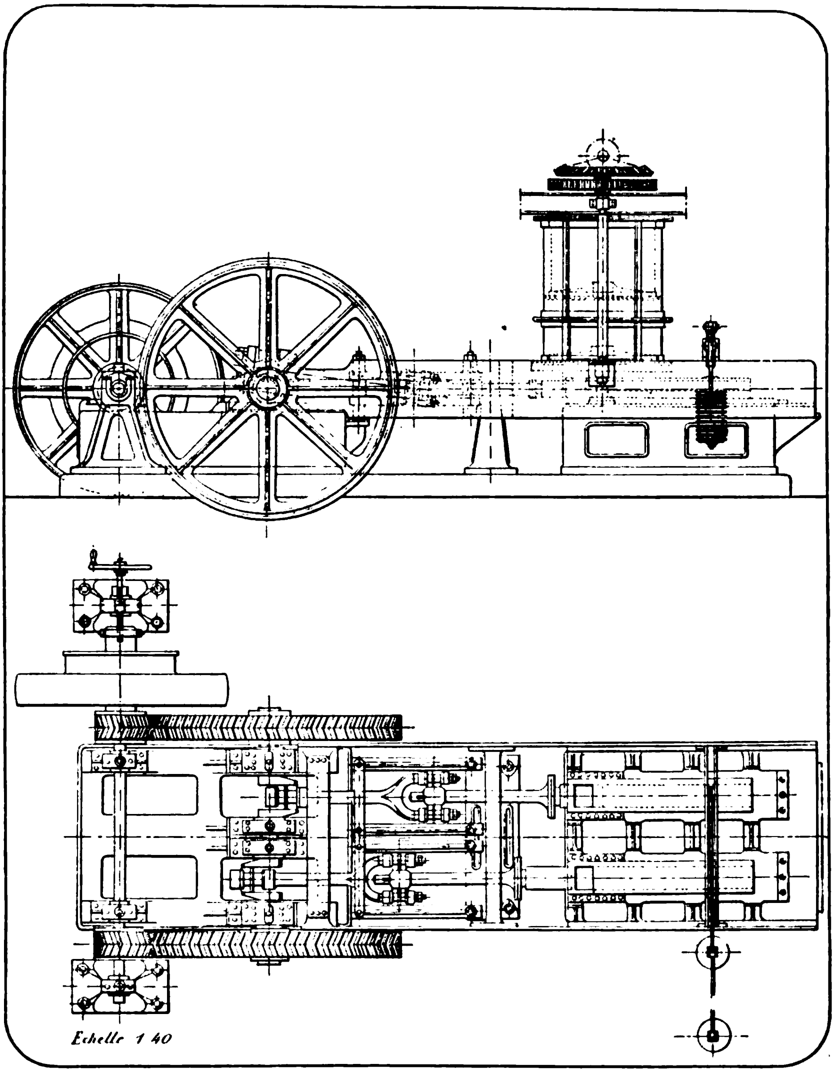


FIG. 4.

The Couffinhal press is manufactured in two different types: For 3-kilogram (6.6 lbs.) briquettes and 5-kilogram (11 lbs.) briquettes. The 3-kilogram (6.6 lbs.) type produces in ten hours 45 tons of full briquettes of 3 kilograms (6.6 lbs.) or 15 tons of perforated 1-kilogram (2.2 lbs.) briquettes.

The price for the 3-kilogram (6.6 lbs.) type is 4,000 francs ($800), and for the 1-kilogram (2.2 lbs.) 5,000 francs ($1,000).

The 5-kilogram (11 lbs.) press can produce 75 tons of full 5-kilogram (11 lbs.) briquettes in ten hours, or 30 tons of perforated briquettes of 1 kilogram (2.2 lbs.).

Arranged for 5-kilogram (11 lbs.) briquettes, this machine costs 23,000 francs ($4,500). The same arranged to make 1-kilogram (2.2 lbs.) briquettes costs 6,000 francs ($1,200) more.

The Bourriez press, with open mold, can produce 150 tons of full 5 to 10 kilogram (11 to 22 lbs.) briquettes in ten hours. The price is 20,000 francs ($4,000). The mixer and cutting table for this press cost 6,500 francs ($1,500).

The plants are generally in the vicinity of the coal mines.

No methods, processes, or machines are patented but the above named.

The briquettes contain from 12 to 18 per cent of volatile matter.

JOHN GROSS,
Vice and Deputy Consul.

LIEGE, *January 30, 1903.*

FRANCE.

MARSEILLES.

The briquette of France, or, as it is known in England, "patent fuel," has acquired an important position in this market, from which it is unlikely to be dislodged, so long as coal retains its supremacy as a generator of steam. The product of the French mines is friable by nature, and until the briquette was perfected, a large percentage of the total output of the mines represented a total loss. The manufactured fuel permits what was once largely refuse to be sold at prices running fairly even with the price of the choicest coal taken out of the domestic mines, and at the same time it possesses certain striking advantages of its own. The French Government requires the railways of the country to maintain a stock equal to their requirements for three months, and this reserve usually consists of briquettes, which are not liable to spontaneous combustion, as in the case of run-of-mine coal, and may be measured quickly and accurately with an ordinary measuring rod. Upon shipboard, these same large briquettes, weighing 16 or 18 pounds, may be stored up to the full height of the bunkers, and in the most economical manner as regards space. As the binder employed is invariably pitch, with a heating value equal to that of the coal itself, the resultant briquette has a heating value equal to that of the best lump coal of the same category. It is understood, of course, that French coal generally is inferior to the high-grade British and American fuels sold in this market for navigation and industrial purposes, and the latter would be preferred to French fuel, either in a natural or manufactured form. As a means, however, of developing the French mining industry and of making possible the existence of important industries, the invention of the briquette holds a place of honor.

RECENT SUCCESS IN BURNING SMALL COAL DIRECT.

While the briquette is destined to continue an important factor in the French coal trade, the cost of manufacture is so great that of recent years every endeavor has been made by the railway companies and the manufacturers of boilers to hit upon some method of burning the low-grade fuel direct, and with a considerable degree of success. The Belgian railway companies were the first to adopt a definite scheme, and as far back as 1895 began to make use of coal dust, which did not cost to exceed 6 francs ($1.15) per ton. In France, the Company of the East first took up the matter, and is now burning washed small coal, which is very pure, but which nevertheless may be bought at a far lower price than run-of-the-mine coal or briquetted fuel. The Paris, Lyons and Mediterranean Railway Company, which has for years burned briquetted fuel exclusively, and owns three large factories for the treatment of small coal mined along its system, has followed suit with considerable success. In the burning of fine coal direct, the fireman is obliged to exercise much greater care, and the grate bars must be brought closer together. Without changing the fire box and by using a combination fuel, the Paris, Lyons and Mediterranean Company has succeeded in securing the same power per hour and per square yard of grate surface as was formerly obtained with high-class fuel alone. In accomplishing this result, both of these French companies employ small coal of rich quality, which tends to conglomerate in the fire. These methods have been adopted by the Paris, Lyons and Mediterranean Railway for the movement of freight, but not yet for the movement of fast passenger trains.

For general industrial purposes, two systems of burning extremely fine coal are now recognized as practicable. One of these involves the feeding of the coal, which, after all, must have a certain size, from a hopper upon a moving grate, as shown in the figure "A."[a] The second system requires the construction within the furnace of a series of narrow shelves, upon which the coal reposes, the grate bars being erected vertically, as roughly indicated in the figure "B."[b]

These great economies are not possible on shipboard, and, granting their complete success, still leaves the briquette supreme as a means of making French fine coal available for navigation and for general domestic purposes. Under this latter head we have in France not only the perforated and cylindrical brick, composed of bituminous small coal bound together with pitch, but also conglomerated anthracite fuel, sold in the form of eggs and balls, and also the "boulets" of charcoal, which are made of the dust gathered up in the holds of the vessels which transport charcoal in large quantities from Corsica to Marseilles.

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[a] Page 44.

[b] Page 45.

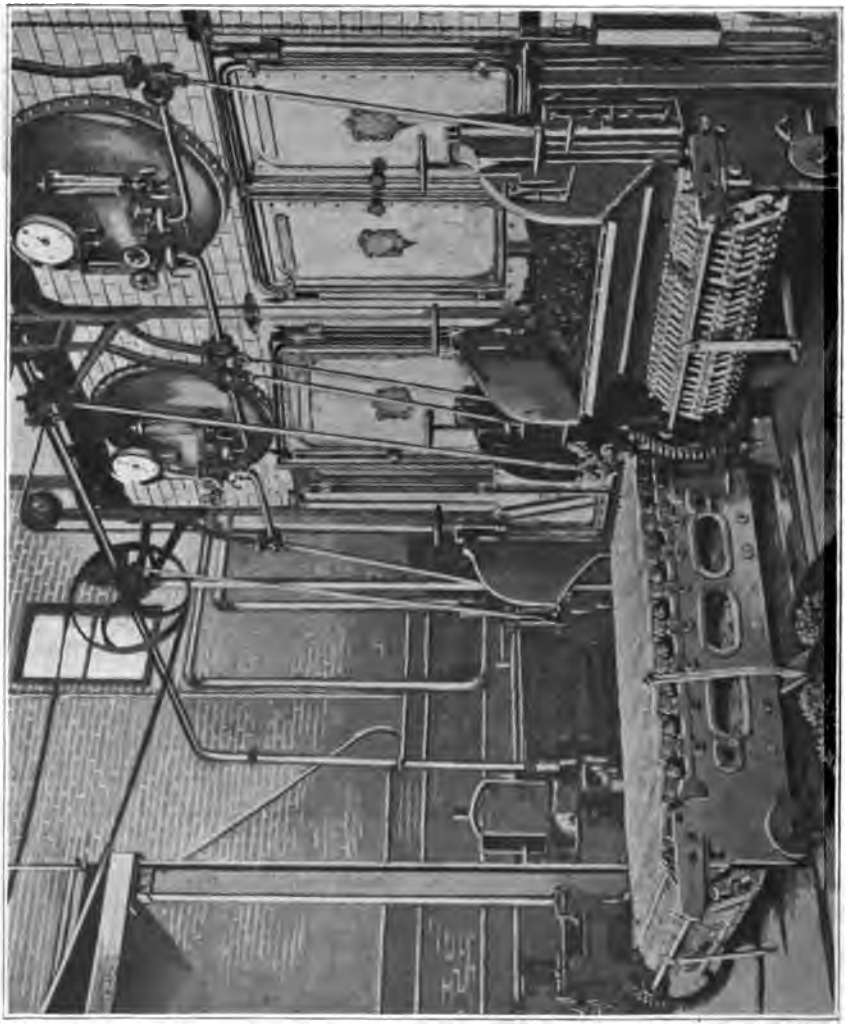

FIG. A.—Babcock & Wilcox system of firing mechanically upon an endless moving grate.

Returning to the utility of this fuel for railway purposes, the matter is summed up very satisfactorily in a letter which I have received from Mr. Noblemaire, director of the Paris, Lyons and Mediterranean Company, the largest in France, and which I translate, as follows:

> Replying to your letter of November 15, I have the honor to inform you that we burn in our locomotives briquettes and large and small coal. The small coal is much

less expensive than large lump coal and the briquettes, and we therefore consume as much of it as possible. However, employed by itself, it does not permit of the development in our locomotives of all their power, and this compels us to add a proportion, more or less great, according to the service, of large coal and briquettes. Upon our system, taken as a whole, the proportion of each of these combustibles is as follows: Small coal, 65 per cent; briquettes, 20 per cent; large coal, 15 per cent. The briquette that we furnish contains 8 per cent of pitch and 92 per cent small coal. We prefer them of small dimentions when we make deliveries directly to the locomotives and in large dimensions when we are obliged to pile them up in our stores. The dimensions and the weights of the different briquettes that we consume are very different. I indicate below the limits between which they vary:

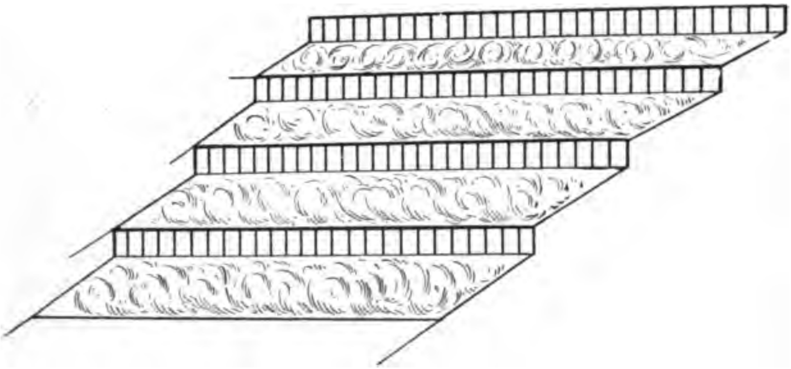

Fig. B.—Suggesting principle upon which small coal and dust may be burned direct. The fuel is fed automatically from a hopper above upon a series of shelves, the draft being secured by means of vertical grate bars.

Briquette	Length.	Width.	Thickness.	Weight.	Diameter.
	Inches.	*Inches.*	*Inches.*	*Pounds.*	*Inches.*
Prismatic	8.27-11.82	4.33-9.45	3.94-10.63	9 -26.40	
Cylindrical	3.94-11.82			1.10-13.20	2.36-5.71

PRESENT METHODS OF CONGLOMERATING IN FRANCE.

Upon the authority of Henri de Graffigny, engineer, it may be said that the mechanical treatment of combustibles has made possible the increase in the coal production of France from 1,000,000 tons in 1820 to 34,500,000 tons in 1899. In the early years of the last century, small coal was unused. The Creusot Company used small anthracite coal as railway ballast. In 1843, Monsieur Marsais invented and constructed the first briquette machines that operated in a satisfactory manner. The product was received with immediate favor. In addition to the advantages heretofore recited, it occupied 10 per cent less space than the same weight of coal. The first attempts were made to conglomerate the small coals without any cement whatever. This method was never accepted in practice. Within the last ten years Prof. Walter Spring, of the University of Liège, conducted interesting experiments along the same lines, and found that with a pressure of 6,000 atmospheres, and without increase of temperature, pulverized coal would take the cohesion of solid coal. It is deemed probable that if the raw material should be heated to 200° C., conglomeration could be obtained with a pressure of less than 6,000 atmospheres. These experiments have been made with oily coal, and as this is easily utilized in the manufacture of coke, it is seldom employed for the manufacture of briquettes. It may be added, moreover, that it is difficult to bring small coal up to a temperature of more than 100° without producing combustion.

Within the limits of a report of this character, it is scarcely worth while to discuss the theoretical side of the question. The actual manufacturers of French briquettes have reached the conclusion that the present method is the most economical, and that pitch is the sole binder available for practical use. Its cohesive power is sufficiently great, and it possesses in itself a high heating capacity, diminishes the amount of cinders, corrects the presence of volatile matter in poor coal, and makes possible the existence of a combustible which would otherwise separate into powder in the furnace and prove entirely useless.

NECESSARY QUALITIES OF THE PITCH.

The pitch used is the residue of the distillation of coal tar, relieved of its light oils when brought to a temperature of 150° C. and of its heavy oils at a temperature of 150° to 220°. If heated beyond the latter temperature it is relieved of its anthracenique oils, of which not more than 5 per cent should ever be retired. The dry pitch remaining in the boiler represents 65 per cent of the weight of the tar. It becomes soft at 70° C., melts between 95° and 120°, and its density is 1.19. Plunged into water at 75° C., it should be quite ductile, the threads being long and thin and 1.08 to 1.97 inches in length. One of the simplest and most exact means of appreciating the quality of the pitch is to place a morsel in the mouth. If too dry, it pulverizes under the teeth. A good quality of pitch crushes without breaking and becomes quite plastic. The price of this merchandise, most of which is imported from Great Britain, rises and falls in sympathy with that of coal. The highest quoted price since 1873 was $11.58 per ton in 1900, and it was as low as $1.79 in 1888.

All qualities of coal are susceptible of being conglomerated; but in France the half bituminous quality of fuel of from 13 to 17 per cent volatile matter is particularly employed. The fine coal of this grade coheres with difficulty when employed directly and becomes much more valuable when manufactured. Certain coals in the Franco-Belgian basin, containing not more than 12 to 14 per cent of volatile matter, also make good briquettes if employed with from 9 to 10 per cent of dry pitch. When the quality of the coal is so low as to contain not more than 10 per cent of volatile matter, the resulting briquettes burn slowly and with difficulty. The lignites are hard to conglomerate alone, but mixed with other combustibles yield a good product. At the factory at Port de Bouc, near Marseilles, the half-rich anthracite coal of the department of Gard and Fuvean lignite (this latter in the proportion of 10 per cent) are used. The resultant briquettes have 19 per cent of volatile matter, contain 8 per cent of pitch, and have a cohesion of 60 to 70 per cent. At Aarau, Switzerland, briquettes are made of peat and anthracite with a pitch binder. These briquettes are 2.75 inches thick and 3.54 inches in diameter. They weigh 1.54 pounds each, and the production of the factory is 30,000 briquettes daily. The mass in the mold is subjected to a pressure of 30 tons.

In 1882, the gas company at Lyons began the manufacture of briquettes of coke, employing the Dupuy machine, turning out briquettes weighing 8.80 pounds each. The coke dust is mixed, without further crushing, with pitch and tar. The impurity of coke dust requires that it shall be washed, and results in a loss in weight of 20 per cent. The washing process costs 29 cents per ton of weight before the washing, and the dust itself being quoted at 96 cents, the washed product stands at $1.56 per ton. These briquettes are used to heat the furnaces, mixed with coke. Without in any manner modifying the form of the fire box 40 per cent of the coke formerly burned is supplied in the form of briquettes. The manufacture of these briquettes is very trying to the machinery, as the powder is almost as disasterous as emery, wearing away the metal with a rapidity that is almost unbelievable. The complete installation has cost the company about $8,685, not including the building. The production per day of ten hours is 6,500 briquettes, the gross weight being 28 tons. For this production there are required 1 foreman, 1 fireman, 3 laborers, 4 boys, costing per day $6.84. The general expenses per day amount to $4.52. The raw material cost is divided as follows:

For—	French currency.	United States currency.
	Francs.	
Washed dust, 25.3 tons, at 8.12 francs	205.62	$39.66
Pitch, 4,305 pounds, at 75.75 francs per ton	148.25	28.60
Tar, 1,538 pounds, at 60 francs per ton	41.95	8.10
Total		76.36

Add thereto the cost of labor and the general expenses, and the total daily expenses amount to $87.72. This makes the cost of the product $3.138 per ton. It should be added that the Dupuy press of present day type would give per day 9,500 briquettes weighing 13.20 pounds each, without any sensible increase in the labor and maintenance cost.

While briquettes are sold in a very large number of forms, the three notable types are: (1) The large square or cylindrical briquettes, weighing about 20 pounds each, which must be broken before use; (2) the perforated rectangular briquette, weighing perhaps 1½ pounds and sold for general domestic and industrial purposes; (3) the round or egg-shaped briquettes, which have the great advantage that they are useful not only for domestic purposes, but may be shovelled easily, and are therefore generally liked for industrial purposes, although usually too expensive for such use. The standard recognized for these briquettes by the French Admiralty is the Anzin briquette, manufactured of an excellent quality of forge coal, purchased in the Anzin basin, and pitch, a combination yielding from 8,200 to 8,500 calories. The manufactured fuel for the navy is required to reach this standard, and the railway services are scarcely less exacting. The briquette for ordinary purposes being in the majority of cases manufactured from coal of the poorest and smallest grade, averages not more than 6,600 heat calories. These commercial briquettes are in large part manufactured of lignite, which is used with difficulty alone, in combination with forge coal and a relatively high percentage of pitch. The lignite represents 4,500 calories, the coal 8,500, and the pitch 7,000 and the average result in practice is 6,600. The French Admiralty and railways require that the contract briquettes shall not yield more than 6 to 8 per cent of cinders, and the average yield in general trade is from 10 to 12 per cent. Because of these requirements it is almost invariably necessary to wash the small coal before the manufacture of briquettes begins, at considerable expense.

THE COST OF MANUFACTURING BRIQUETTES.

There is a very wide difference between the cost of manufacture of the briquettes, attributable not only to the obsolete machinery employed in many cases, but to the conditions under which the coal is produced. The labor cost runs from 11 to 30 cents per ton, including the discharging of the coal and the loading of the briquettes. The wear and tear of the machinery is seldom less than 5 cents per ton, and occasionally reaches from 19.3 to 38.6 cents per ton. The briquette press appears to be a delicate machine, which must be the best of its type, in order to give satisfactory results. It may be interesting to supply in detail the expense per ton of manufacturing the briquettes in one model plant, composed of two Biétrix presses (figs. C and D)[a] producing 250 tons per day, working twenty-four hours per day:

Labor cost:	Centimes	
Superintendent	4	$0.007
Manipulation of cars	3	.005
Discharge of pitch	5	.009
Discharge of coal	6	.012
Crushing material	17	.032
Manufacture	21	.041
Loading trucks	8	.015

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[a] Pages 51 and 52.

Labor cost—Continued.	Centimes.	
Miscellaneous labor	6	$0.012
Firemen and engineers	10	.019
Total labor cost	80	.152
Supplies:		
Oil and grease	9	$0.017
Miscellaneous	7	.014
Wear and tear on machinery	10	.019
Fuel, at 6 francs per ton	31	.010
Total	57	0.11

In making up this total, labor is calculated at 60 to 77 cents per day. In another plant, composed of Rivollier presses, the total cost per ton amounts to 42 cents. This plant requires the services of 41 men, who are paid at from 60 to 65 cents per day.

The most important item in the first cost of the coal briquettes is the pitch, the price of which is twice as much in the interior as at the seaboard. Assuming as a minimum a consumption of 6 per cent of pitch at the lowest price—that is, $5.79 per ton—the cost under this head would be 34.7 cents. Add thereto the expense of labor and miscellaneous materials, estimated at 28.9 cents, and we have a total theoretical cost of 63.6 cents per ton. However, the seaboard factories usually work for the marine and employ at least 8 per cent of pitch in order to secure a satisfactory cohesion. Under these circumstances the minimum cost of manufacture and material would reach 75.2 cents. My authority, Mr. De Graffigny, furnishes other figures, which lead him to say that a maximum of $1.698 per ton for labor and materials should never be exceeded by a well-organized plant.

The plant at Flers (Nord) is considered fairly representative, and is quoted for a production of 220 tons per twenty-four hours. It includes a washing apparatus for cleansing the coal, a double Bourriez press, a 50-horsepower Corliss engine, and various other machines, tram lines, warehouses, stables, forge, ten houses, loading crane, one locomotive, four cars, and cost $135,100 in 1881, not including the land.

Generally, the coal as delivered to the pressing machines is washed, and consequently damp. When the humidity exceeds 4 to 5 per cent, it is necessary to remove the excess. The presses, which apply a pressure lasting relatively for a considerable time, such as the Rivollier, Evrard, and Bourriez, relieve the paste of the excess water, and give good results, even though the paste as it enters contains as much as 10 per cent of water. The Rivollier is the only machine which absolutely guarantees this result. The presses operating instantaneously, like the Biétrix, which is manufactured by the house of Couffinhal et Ses Fils, at St. Etienne (Loire), give excellent results, but the product requires careful drying. It is recognized as necessary and useful to leave 1½ to 3 per cent of water in the paste when ready for the press. This quantity contributes to the plasticity of the mass during the application of the pressure. In no event does the density of the briquette equal that of solid coal. There remain always certain spaces between the component particles, and if the paste is too dry these spaces contain compressed air, which diminishes the solidity of the mass.

The cohesive power of the briquette is naturally a matter of the very highest importance. M. Wèry, engineer of the Paris, Lyons and Mediterranean Railway Company, reports the following experiments with a Biétrix machine under this head:

	Cohesion.
Briquettes containing 6 per cent of pitch:	
Pressure per square centimeter (0.1551 square inch)—	
130 kilos (286 pounds)	per cent.. 25
190 kilos (418 pounds)	do.... 46
270 kilos (594 pounds)	do.... 61
Briquettes containing 7 per cent of pitch:	
Pressure per square centimeter (0.1551 square inch)—	
130 kilos (286 pounds)	do.... 52
190 kilos (418 pounds)	do.... 70
250 kilos (550 pounds)	do.... 74

PRESSES COMMONLY USED IN FRANCE.

A properly organized plant includes:

(1) Battery of boilers.
(2) Engine.
(3) Coal crusher, or, if fine coal be supplied from the culm bank, a drier.
(4) Pitch crusher.
(5) Measurer of pitch and coal.
(6) Machine for mixing and heating the paste.
(7) Presses.
(8) Endless carrier for cooling the briquettes.

Coal crushing, washing, and drying machines are certainly familiar enough in the United States. The pitch should be crushed as finely as possible, and preferably should be melted before being mixed with the coal, and brought to the temperature chosen for the fusion. In France the pitch is melted in huge basins, with bottoms slightly inclined toward the point of discharge. The load is usually 7 tons. Frequently the pulverized pitch is mixed dry with the coal, and the mixture is then brought to the proper temperature. When the coal receives liquid pitch it is indispensable that the apparatus by which the latter is transported be heated.

The mixing mill consists of a vertical cylinder, within which a shaft operates swiftly moving paddles upon the churn principle, by which the incoming pitch and coal are beaten and mixed as they move downward toward the point of discharge. This cylinder is heated by steam. Theoretically the requirement is from 8.80 pounds to 11 pounds of steam at

100° C. to heat 1 ton of paste to the same temperature. In practice it requires as much as 110 pounds of steam per ton. In some plants superheated steam at 200° is used. It may be calculated that, if steam at 200° leaves the mixer at 100° after having left its excess of heat in the paste, it is necessary to use 110 pounds of steam per ton of paste. The dimension of the heaters should be such that the paste needs to remain in them not more than ten minutes. A little experience demonstrates whether or not the mass is thoroughly mixed. If it retains some water, which it always does if the heat be supplied by steam, it should be homogeneous, and should readily conglomerate under the pressure of the hand.

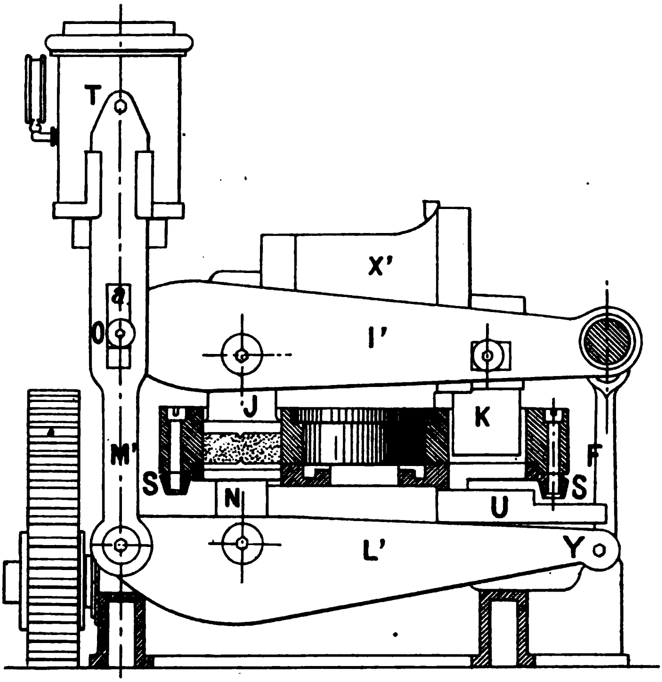

Fig. C.—Biétrix-Couffinhal press. (Elevation.)

To describe the various operations of the many presses in daily use would require much space and give no very clear understanding. At the present time, the British presses are in the ascendant, although the Biétrix machine (Figs. C and D), manufactured by Messrs. Couffinhal & Fils at St. Etienne, probably stands equally high. This latter machine presses the briquette simultaneously on its two faces, upon the principle of the nutcracker. These presses are in use at Nœux, Blanzy, Anzin, Marseilles, Rochebelle, and Rive-de-Gier. The various models produce 18, 50, 90, and 150 tons in twelve hours. The weight of the briquette is usually 13.20 pounds, but may be increased to 25 pounds. The Biétrix is a very strong press, requires little power, and costs little for maintenance. Its successful operation requires a paste containing 1½ to 3 per cent of water and 6 to 9 per cent of pitch. The pressure varies from 196 to 264 pounds per square centimeter.

Another excellent press is that of Th. Dupuy & Fils, Paris (Fig. E). This company guarantees to supply plants producing over 100 tons of briquettes weighing 13.20 pounds each or 32 tons of 1 kilo (2.20 pounds) each, per day, for $14,275, external shed included. This machine is in use at Albi (Tarn), Courrières, and St. Eloy, and is used also for the manufacture of coke briquettes by the gas company of Lyons. The builders calculate 2 horsepower per ton of briquettes produced per hour, to which must be added 2 horsepower per hour and per ton for the several necessary operations.

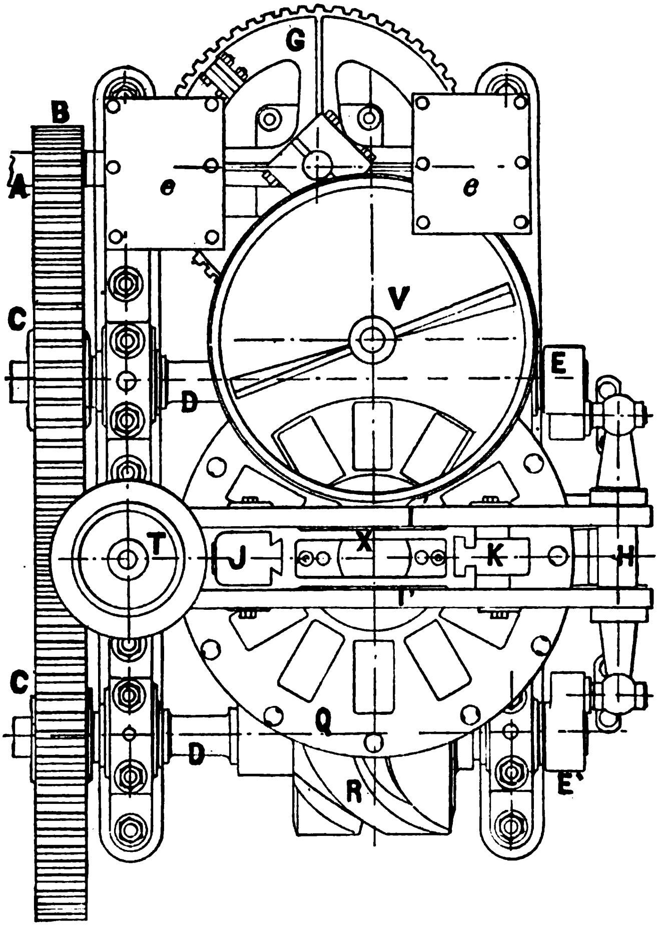

FIG. D.—Blétrix-Couffinhal press. (Cross elevation.)

The Mazelin press is manufactured by the Compagnie des Forges et Chantiers de la Mediterranée, Marseilles. It is a relatively cheap machine, but is well spoken of.

The presses for the manufacture of balls and egg-shaped fuel (Fig. F) operate upon a different principle from the others. Those manufactured by Th. Dupuy & Fils, Paris; A. Robert, of Gilly, Belgium; Fouquenberg, of Wasmes-en-Borinage, Belgium; and Zimmerman, Hanrez & Co., of Monceau-sur-Sambre, Belgium, are most frequently employed. At Blanzy a Zimmerman machine produces 7 tons of balls per hour.

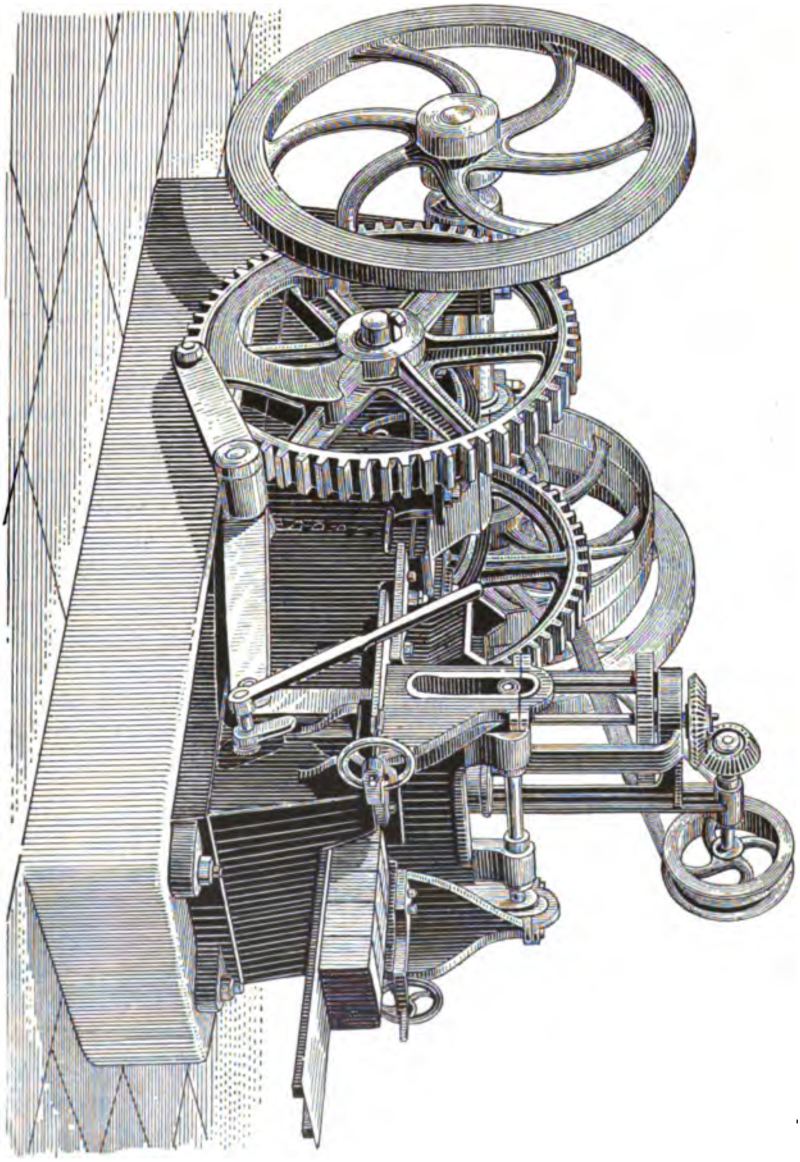

FIG. E.—Press of Dupuy & Fils.

While the briquettes are sometimes piled directly into railway trucks, the rule seems to be to discharge them from the press upon a long conveyor, which permits them to cool and prevents the high percentage of breakage which is certain to result if they are handled while still warm.

To test the cohesive power of the manufactured briquette, 110 pounds of briquettes are divided into 100 pieces of 1.10 pounds each, which are placed in a cylinder 36.22 inches in diameter and 39.37 inches in length. This cylinder is divided into three compartments by diametrical partitions and revolves at a speed of 25 revolutions per minute. After being charged, it is revolved for two minutes, and the contents are thereupon sifted upon a screen perforated with holes 1.12 inches square. The proportion which does not pass through this sieve indicates the degree of cohesive force, which, in the case of the French Admiralty tests, should reach 52 per cent, or if the fuel be intended for torpedo-boat use, 58 per cent. The Admiralty also requires that at 60° C. the briquettes shall not soften.

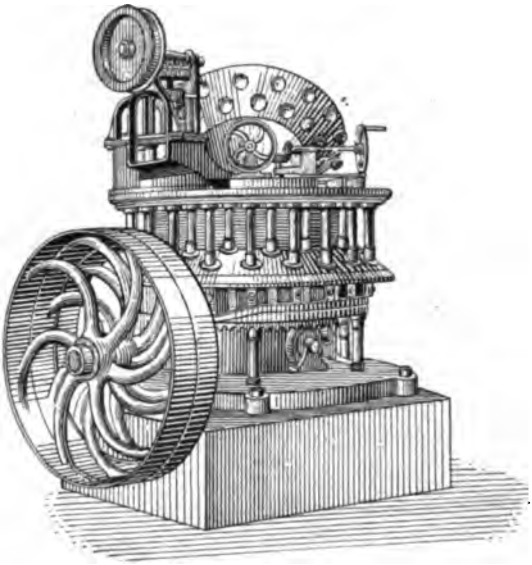
FIG. F.—Press for manufacture of balls.

PRESENT PRICES OF BRIQUETTES AND COAL.

For the purpose of establishing the relation in the consuming market between briquettes and the coal of various sizes from the same mines as those that furnish the coal used to manufacture the briquettes, I quote the retail prices of the Compagnie des Mines de la Grande Combe, delivered in Marseilles:

	Per ton.
Square briquettes:	
13 by 8 by 3 inches	$8.49
6 by 6 by 2 inches (perforated)	9.26
"Grelons gras," selected coal for kitchen	8.49
"Menus," small coal	6.36

Thus it appears that the briquettes command as much or more than the best natural coal mined by the same company.

CONCLUSIONS WITH RESPECT TO THE UNITED STATES.

My conclusion is that the manufacture of briquettes is of the utmost importance in France, where the native fuel is poor in quality and must be subjected in large part to artificial treatment; also, that the production of this fuel may be advantageously taken up in the United States. However, I believe that as a rule we have a more direct interest in studying methods of burning our small coal as such, by means of inclined fire boxes and other devices heretofore mentioned. In the development of these methods, the Babcock & Wilcox Company have taken a very prominent part, but I doubt whether they have pushed their coal-burning devices as much in the United States, where fuel is cheap, as they have in Europe. The stairway-grate idea was originally developed in Bohemia, I believe, but has been perfected by the Babcock & Wilcox Company. Certainly, every coal company could utilize its refuse in generating its own operating power with greater economy than by converting it into briquettes. The industries located in coal-mining regions could advantageously adopt the same methods. When there is a surplus of poor coal after these demands are satisfied, the conversion of the residue into briquettes may be undertaken, with assurance that if the work be scientifically carried on, the product will sell on a plane with large coal of the same grade, and will give satisfaction to the consuming public.

ROBERT P. SKINNER,
Consul-General.

MARSEILLES, *December 19, 1902.*

LYONS.

Fuel briquettes and "boulets"[a] have been used throughout France, except in the heavily wooded mountain districts, for the past fifty years. Both are thought highly of as fuel, especially the briquettes. They are more easily handled than coal and are ignited more readily. It is a widespread popular belief that they also throw out more heat. On railroad locomotives and in the marine service, they are preferred to coal, as their heat is more reliable, which enables closer calculation to be made as to the amount of steam that can be obtained. Briquettes can be preserved indefinitely without loss from exposure to the elements. Several cords of briquettes have been piled at the railroad station at Chagny for twenty years without showing signs of deterioration. The fact that they are so easily handled makes them very popular among firemen and engineers on both locomotives and steamships, but being dearer than coal they are, so far as I can learn, seldom used in manufacturing establishments.

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[a] See p. 58 for illustration.

The briquette makers in France were astonished to learn that this fuel is not manufactured to any great extent in the United States, where so much coal is used and where necessarily an exceedingly large amount of coal dust must be wasted.

In France, there are seventeen establishments for manufacturing briquettes and bullets. In the department of the Loire are located nine works, which in 1900 made 197,555 tons of this fuel. The output never declines, but on the other hand is every year characterized by a continuous increase.

Following are figures for the output of briquetted fuel in the mining districts of France for the years 1900 and 1901:

Company.	1901.[a]	1900.[b]
District of the Loire.		
	Tons.	*Tons.*
Mines of Roche la Molière & Firminy	20,660	17,781
Mines of the Loire	2,718	1,834
Mines of St. Etienne	25,450	19,200
Mines of Ville-Bœuf	28,924	29,608
Mines of Gros	10,116	17,246
Mines of the Chazotte	43,723	31,218
Mines of the Peronnière	79,410	76,143
Mines of Rive de Gier	....	....
Mines of Ban la Faverge	2,749	4,525
Total	212,750	197,555
Department of Pas-de-Calais.		
Carvin	5,773	....
Courrieres	1,431	2,588
Department of Pas-de-Calais—Continued.		
	Tons.	*Tons.*
Lens	68,594	76,919
Meurchin	94,001	97,357
Moeux	105,426	96,848
Ostricourt	53,800	52,350
Total	329,025	326,062
Department of the Nord.		
Anzin	221,960	183,883
Escarpelle	42,330	41,888
Flines-lez-Raches	30,081	27,725
Total	294,371	253,496
Aggregate total	623,396	579,558

[a] Approximate figures.

[b] Official figures.

It will be seen from the above statement that the production for 1901 increased 43,838 tons over 1900.

The briquetted fuel is liked because it is free from stones and clinkers and is cleaner to handle. A dealer told me that it is largely used by wealthy families. Personally, I prefer to burn briquettes in my own household because they ignite very readily, make a cheerful flame, and throw out a good heat, and because it is easier to put a briquette on the fire than a shovelful of coal. There is absolutely no dust in them, and one can handle them without getting one's fingers dirty.

At the present time, small coals bring only 10 to 10½ francs ($1.93 to $2.03) per ton, when a sale can be found; but when converted into briquettes they fetch 20 to 22 francs ($3.86 to $4.25) per ton.

The manufacture of this "patent fuel," as it is called in England, has been carried on in different parts of Europe for over half a century, and it is now a prosperous business in France, Germany, Austro-Hungary, Belgium, and Wales. Some four years ago, a citizen of Bavaria by the name of Kohlendorfer made petroleum briquettes of petroleum refuse and sold them as fuel. The process was as follows: Ten parts of soda lye and 10 parts of fatty matter, such as tallow, were heated in a boiler. To this mixture was then added 80 parts of petroleum refuse and, later, coal dust and sawdust. A product of less solidity was obtained by the use of resin acid instead of grease. In both cases, the product contained more than 90 per cent of combustible substance and about 5 per cent of noncombustible residue.

About 600,000 tons of briquettes was annually shipped to European ports from Wales during 1898, 1899, and 1900. All the fine coal in the Welsh coal mines is utilized in making patent fuel.

METHODS OF MANUFACTURE, PRICES, ETC.

In manufacturing the briquettes, the quantity of pitch used varies with the proportion of bitumen in the coal—the greater the amount of bituminous matter the smaller the quantity of pitch. The average proportion of pitch required is from 7 to 9 per cent. After the coal has been screened at the colliery, it is reduced by a disintegrator to as fine particles as possible. The pitch is then added, and the mixture is ready for the heater. The most common way of mixing is the dry method, by which the pitch is ground up with the coal in a dry state.

Various figures have been given in the different countries of Europe regarding the calorific power of the briquettes. Experiments made with this fuel in the Brussels gas works resulted in the production of 450 cubic meters (15,892 cubic feet) of coal gas per ton, the quality of which was superior to the ordinary coal gas. It was also demonstrated a few years ago, at the Cochet Maillard works in Paris, that a poor fuel could be raised one-third in calorific power by the addition of 8 per cent of the Vilna mixture, of which the Vilna briquettes are composed. Experiments made at Brussels have been productive of similar results. It is a common assertion in Germany that the ordinary heating power of briquettes exceeds that of hard coal by 30 per cent. Worthless coal dust when mixed with briquette composition becomes as good a gas producer as the best coal. The boiler in the Cochet Maillard works at Barmen consumed 75 to 80 kilos (165 to 175 pounds) of coal in three hours to maintain a steam pressure of 4 atmospheres. With 65 kilos (143 pounds) of anthracite dust, to which had been added 8 per cent of the briquette mixture, the same pressure was kept up three and one-half hours.

Several kinds of adhesive matter are mixed with the coal dust. Which is best could be determined only by a comparatively expert investigation. In Barmen, Germany, petroleum residue is used. In another manufactory there is utilized the distillation of shale or other mineral oil, mixed with any animal fat readily accessible, the whole saponified with soda to an emulsion, one to two hundredweight of the emulsion being employed per ton of coal dust. Ordinary brown coal, very mediocre in heat, developing only 4,000 to 5,000 calories, will, when converted into briquettes, give 8,000 calories. This is also true in regard to the coke and coal dust found near gas works, coal mines and yards, and generally considered without value.

The bullets, of which I have spoken, are about the size and shape of a large clam. Like the briquettes, they are made of an agglomeration of 92 to 94 per cent coal dust or crushed coal with 6 or 8 per cent coal tar. Any kind of coal, anthracite or soft, may be used in their manufacture.

The cost of the coal dust varies with coal quotations. In France it is about half the price of coal, varying from 8 to 15 francs ($1.55 to $2.90) per ton. The tar costs in France from 40 to 50 francs ($7.72 to $9.65) per ton, but follows the price on the English market. Brai, which is often used in the place of coal tar, is a mixture of solid carbures at an ordinary temperature and melting at 75° or 80° C.

Briquettes and bullets.

The cost of producing briquettes varies, depending upon the equipment of the mill and upon the rate of wages paid. It may be stated as a fair estimate that six workmen can turn out 100 tons a day. The equipment for such a plant would cost in France 100,000 francs, or about $20,000.

The market price of briquettes follows the price of coal, the former being about 5 francs ($0.965) per ton higher than the latter. The retail price of briquettes is about 20 per cent higher than the wholesale price.

A number of establishments in France manufacture briquetting machinery. The most important are:

Etablissements Biétrix, Leflaive & Cie., St. Etienne.
Forges et Chantiers de la Méditerranée au Havre.
Le Petit Creusot, Chalons-sur-Saône.
Maison Voillon à Alais.
Depuy à Paris.

Briquettes might possibly be made of peat, sawdust, or lignite. In some parts of Germany they are manufactured of peat without any adhesive agency. In Sweden they are made of sawdust. Generally speaking, it is only lignite that can be profitably worked up into briquettes. This part of the business is still largely in an experimental stage. It is quite probable, however, that in the United States peat may be found, which, mixed with the residuum of petroleum, would make good fuel briquettes.

The Biétrix machine (manufactured at St. Etienne) that I saw in operation at Montceau les Mines,[a] turns out from 18,500 to 19,000 briquettes per day, the weight of each briquette being 14 pounds.

From five to eight workingmen and a foreman can produce about 100,000 kilograms, or 11,000 tons per day. But with better facilities for handling and storage, and with proximity of plant to the mine, this output could be increased.

The manufacturing houses above referred to can erect anywhere in the world a thoroughly equipped plant for the manufacture of briquettes.

REMARKS.

Briquetting machines have been in very extensive use in France for many years, the relatively high cost of coal and the economical character of the population combining to foster the development of this method of avoiding waste, and but very little, if any, slack and coal dust is lost.

The French locomotives are in great part fired with briquettes, which are also beginning to be used in factories, power stations, etc. A large part of the reserve supplies of fuel at the principal railway junctions, docks, yards, etc., consists of briquettes, which, for several reasons, are particularly adapted to this purpose. They do not deteriorate as rapidly as rough coal. They can be more neatly piled and at a steeper slope, so that a large amount may be stored on a comparatively small area. The regular form of the piles checks peculation, as the abstraction of even the smallest number of briquettes would at once become apparent. As an additional precaution against pilfering, it is the practice to whitewash the corners of the piles.

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[a] See pages 63-70 for illustrations.

There is, of course, some waste of coal in small yards, where the amount of slack and dust is too insignificant to handle with profit; but with this exception it may be said that all the coal that would otherwise be lost is utilized in the form of briquettes. And this is true even of the dust and slack of the anthracite coal imported from England and Belgium.

Within the past year or two, attention has been drawn to the briquetting of fine coke from the gas works. This has not been carried out to any extent as yet, but probably will be in the near future.

The briquetting of ores, flue dust, etc., is practiced to some extent in France, but is not a very important industry, the general metallurgical output of the country being relatively much less than elsewhere.

The machinery employed consists chiefly of apparatus for mixing the materials, of presses, of a drying plant, and of the necessary transporting and handling facilities.

I am told that French briquette makers do not look with favor upon machinery in which the mixers are combined with the press, but prefer separate machines. With this exception, it is said, the differences between the plant used here and that furnished by American builders of briquetting machinery is only in matters of detail.

Some two years ago a careful comparison was made, I am told, between American and French briquetting machinery, with a view to purchase by a large French concern. There appeared to be no very great difference between the two, and the American machinery would probably have been ordered had not a general slump in orders for briquettes resulted in a putting off of the erection of the works for which these presses were intended.

The importation into France of American briquetting machines may be possible, but it would be enormously handicapped by the French tariff, which is based upon weight, and as briquetting machinery is very heavy the duty would be onerous.

I send with this dispatch a small specimen of brai, the material used as a cohesive binder in the manufacture of briquettes at Montceau-les-Mines.[a]

JOHN C. COVERT, *Consul.*

LYONS, *January 28, 1903.*

PARIS.

There are no exact data for reckoning the amount of briquetted fuel consumed in France annually, but it is probably well over 2,000,000 tons and is increasing. From information concerning the principal factories, kindly supplied by M. Ed. Lozé, of Arras, Pas de Calais, I find the production in 1900 and 1901 was as follows:

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[a] Filed in the Bureau of Foreign Commerce.

Class.	1900.	1901.
	Tons.	*Tons.*
Naval	412,955	455,556
Railway	914,547	1,069,346
"Boulets," etc	216,175	167,249
Particulars not given	220,687	190,679
Total	1,764,364	1,882,830

This list is exclusive of the small makers, who manufacture mainly for domestic use, and of whom there are several in Paris and other cities of France. "Naval" briquettes are large, rectangular blocks, weighing from 16 to 22 pounds; "railway" are about half that size. For domestic purposes flat bricks perforated with 6 to 10 holes are used, and also "boulets"—ovoid lumps of various sizes.

Anthracite coal is not suitable for briquettes, as it requires a larger percentage of resin or tar. Briquettes made from it burn slowly and crumble into dust. A coal that is too "rich" and burns with a long flame is also unsuitable, as the briquettes give too much smoke and burn too rapidly. A mixture of anthracite and bituminous coal gives good results and does not require much tar; but the best of all is a single coal not too bituminous—what the French call a "demi-gras" coal. Lignite alone is unsatisfactory, but a demi-gras coal with 10 per cent of lignite and 8.5 per cent of tar makes a good briquette. Peat is sometimes used, mixed with anthracite and tar.

The cost of manufacture (materials, labor, and interest) is given by M. Lozé at 15 francs 10 centimes ($2.91) and by another authority at 17 francs ($3.28). The present retail price of "boulets" in Paris is 55 francs ($10.70) the ton.

There are very many types of machines used, according to the materials employed. The coal is crushed to a dust in a pulverizer, is mixed with coal tar—the best bonding material and the one most generally used—and the paste is molded in close (in the Marsais, Mazeline, and Revolier machines) or in open molds (the Evrard machine). In the Verpilleux and David & Jarlot machines, the paste is turned out in an endless block, which is sawn as it leaves the machine.

The makers of briquette machines include the following:

M. M. Biétrix, Leflaive, Nicolet & Cie., St. Etienne, Loire.
Couffinhal et ses fils, St. Etienne, Loire.
Dupuy et fils, 22 Rue des Pelets Hotels, Paris.
A. & M. Lacroix, 177 Quai de Valmy, Paris.

The factories are mostly in the Nord, Pas de Calais, Bouches du Rhone, Gard, Herault, and the basin of the Loire, but a few are in other parts of France. The largest factory (Anzin) turns out 730 tons a day, and Grand Comebe (Gard) 700 tons a day. The number of workmen is not stated, but is proportionately small.

The number of patents connected with briquette machines is very large, and it would be impossible to give an account of them. Several of the best are, I believe, the invention of M. M. Biétrix, Leflaive Nicolet & Cie., of St. Etienne, who have already been mentioned.

No calculations exist, so far as I am aware, showing the heating value of briquettes, but it is generally stated in all the text-books to be "very little inferior to coal."

In conclusion, I may add that briquettes are used to some extent in the French navy and very largely by mail steamers. Their use for railway locomotives is increasing yearly. One railroad (the Paris, Lyons and Mediterranean) manufactures 200,000 tons a year for its own use.

JOHN K. GOWDY,
Consul-General.

PARIS, *February 17, 1903.*

ST. ETIENNE.

The idea of transforming coal dust into briquettes was first entertained and put into practice about thirty years ago by a St. Etienne engineer by the name of Marsais.

The industry has since that time made rapid progress, so that to-day nearly every hard or soft coal mine in France turns out a considerable amount of briquettes of different shapes and sizes.

The honor of constructing the first and subsequently nearly all machinery necessary for this industry may also be claimed for St. Etienne, as the important firm of Biétrix, Leflaive & Co., of this city, supplies not only all France, but also most of other European countries with briquette machines. Of these, Germany has taken a very large number and is continually ordering more.

The agglomerating machines invented and patented over all the world by Biétrix & Co. are on the system of double compression, as the accompanying illustrations indicate. (See figs. 1–5.)

DESCRIPTION OF BIÉTRIX MACHINES.

The machine is put in motion by a horizontal shaft connected with a motor which need not be of any special system. This shaft commands, by means of a pinion, cogged wheels fixed at the ends of two shafts placed symmetrically as regards the principal axis of the machine. These latter are furnished at the opposite extremities with cranks acting on the two vertical crank rods, as seen in the illustration.

These rods act in their turn on a horizontal yoke, which transmits its alternative up and down movement to two working beams placed above the table furnished with alveoli and bearing the upper molding piston and the ejector piston. These last are guided by a central piece fixed to the body of the machine.

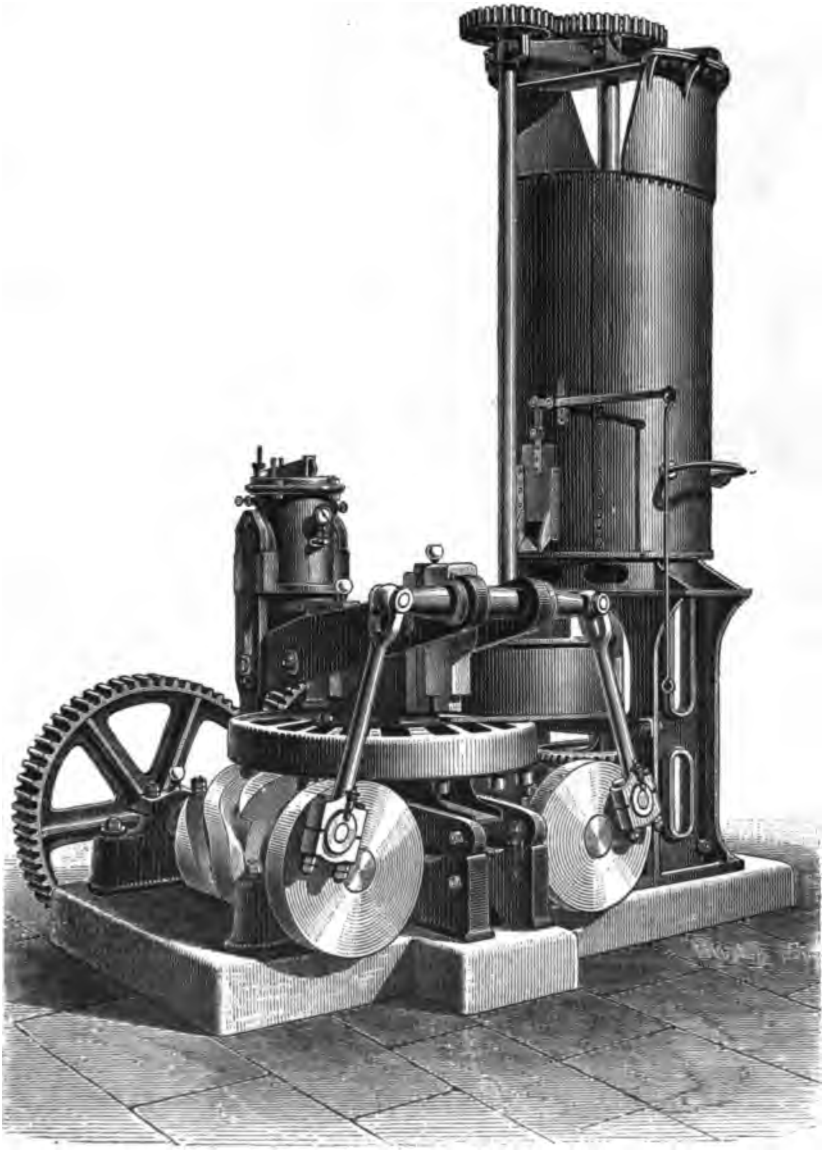

FIG. 1.—Agglomerating machine. (Complete.)

A pair of working beams similar to the preceding work the under piston beneath the table. They turn around an axis situated in front in the middle vertical plane, passing through the yoke, and their opposite extremities are in relation with the corresponding extremities of the top beams by means of two metal uprights, on the top of which is fixed the cup of the hydraulic press regulator.

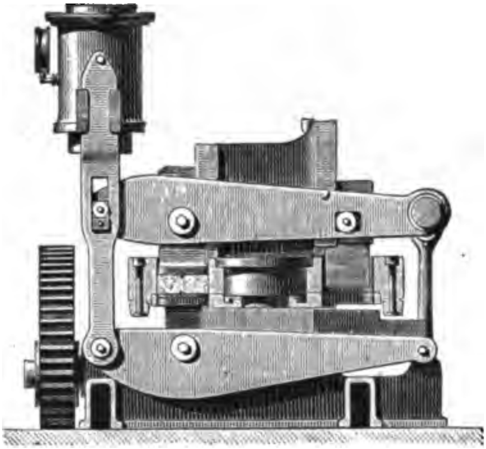

FIG. 2.

When the compression is produced by the lowering of the beams and the piston situated above the table, a moment arrives when the upper part of the briquette can not descend any more on account of the resistance presented by the lower piston and also by reason of the friction of the coal against the walls of the mold. At this instant, the lower surface being less pressed than the upper, a reaction takes place; this last becomes fixed, and the lower piston acts in its turn until the pressure becomes equal on both sides. The mechanism is very simple, reminding one of that of a nutcracker.

The posterior axis of the upper beams can be displaced in a slot in the vertical metal posts already mentioned. It is connected with the piston of the hydraulic press cup seen in illustration No. 1. By the tension of the spring contained in this apparatus the desired amount of pressure on the briquettes is obtained with facility.

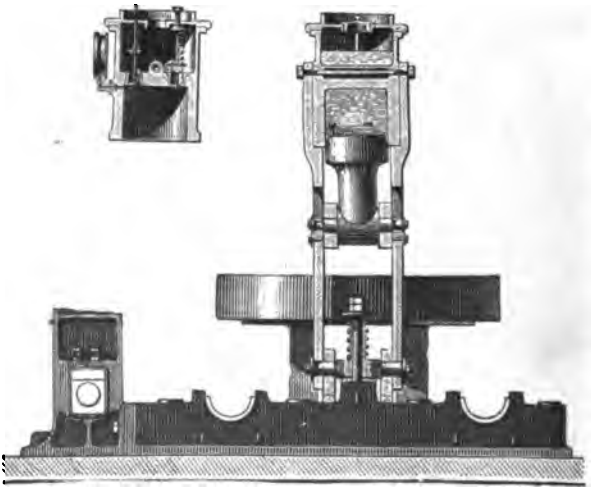

FIG. 3.

The compression is effected in three periods of time: First, the upper piston acts alone: second, the inferior piston moves up until the pressure is equal on both sides of the briquettes; third, the piston of the press cup enters into the hydraulic cylinder as soon as the pressure is obtained and until the point of the dead center is passed by the cranks.

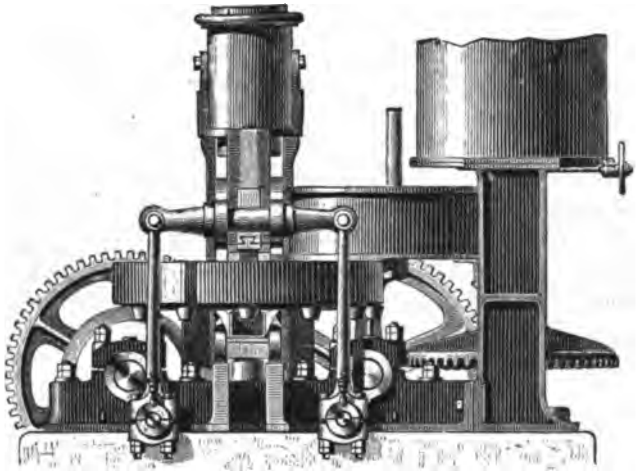

FIG. 4.

The table is put into place by a drum grooved in a particular way, easily understood by examining the first illustration. The alveoli are filled by means of an ordinary distributer fed by an apparatus for the preparation of the mass. The briquettes leave the machine on a swing table or on an endless belt conveyor placed under the machine.

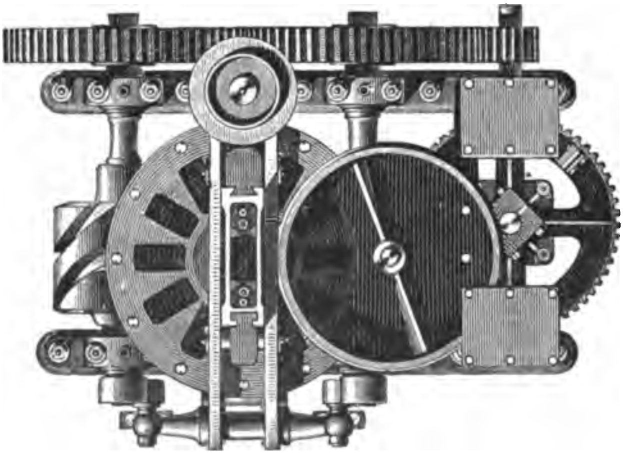

FIG. 5.

The advantages claimed by the inventors of this double compressing machine might be briefly stated as below:

Condensation in a small volume of a strong and powerful apparatus capable of great production; considerable strength of compression on both faces of the briquettes, permitting great solidity and great homogeneity of the material; possibility of giving to the briquette, on each of its faces, forms or grooves, rendering it easy to break; advantages of being able to manufacture briquettes of a perfectly defined shape with a minimum of waste in transport and manipulation; motor power reduced to a minimum; all the organs of the machine under control before the eyes, rendering them easy to be kept in order and replaced when necessary with little loss of time; finally, the great speed of the machine, represented by 35 strokes of the piston per minute.

The above agglomerating machine is built in three sizes, and the following table gives the daily production of eleven hours and the normal weight of the briquettes:

Size.	Weight of briquettes.	Production per day.
	Kilos.	*Tons.*[a]
No. 1	3	55- 60
No. 2	5- 6	90-100
No. 3	9-10	140-160

[a] The metric ton used in this report equals 2,204.6 pounds.

SMALL-SIZED AND PERFORATED BRIQUETTES.

Certain mines make small briquettes, as they are in great demand for domestic use. The Biétrix Company also delivers machines for this purpose, that make six briquettes of nearly 2 pounds in weight at each stroke of the piston.

Perforated briquettes are consumed in large quantities in Paris. They are obtained by a simple modification of the table and the pistons. Each machine can be furnished, if necessary, with a series of tables to suit any requirements.

PREPARATION OF THE MASS.

The compression of the mass is very important in the manufacture of briquettes. It is prepared and rendered sufficiently plastic by the addition of a small quantity (6 per cent) of brai (the residue of coal tar after distillation). For a long time a steam malaxor was employed for this purpose, and because it was simple and cheap and easy to keep in order many mines used it, but when high pressure is employed, as in the Biétrix machines, it is absolutely necessary to eliminate the greatest quantity of water possible from the coal. Each time, consequently, that the coal is washed, which is generally the case in France, a drying apparatus is required. In such case the malaxor is almost useless. The same enterprising firm responded to the necessity by constructing a special oven. (See fig. 6.)

DRYING OVEN.

This oven is circular in shape, composed of a revolving platform of cast iron, and works continuously with the agglomerating machine. The platform is surrounded with masonry covered with sheet iron on which rests a dome with a passage in the center for a cylinder of cast iron with a shaft furnished with flukes. A lateral fire box produces the temperature necessary to the heating of the coal and the elimination of any excess of water. The flames after passing over the upper surface of the coal heat the dome, pass under the revolving table, and escape at the opposite end by a chimney.

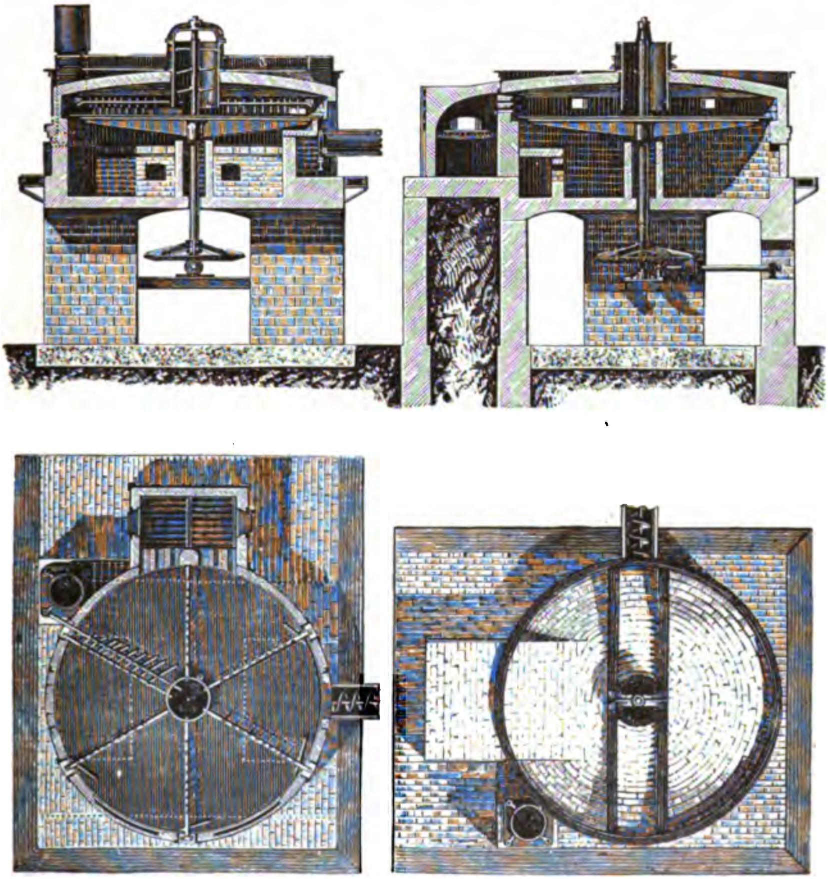

Fig. 6.—Oven with revolving table.

Around the covering of the oven are arranged six openings. The first four are used to introduce traverses armed with spikes which turn the material in every sense, presenting all its parts to the heat of the flame. Opposite the fifth aperture are two bars, one fixed, the other mobile, which by the aid of a small articulated shutter, like a venetian blind, bring gradually the material from the center to the circumference by turning it like the spikes. These blinds also regulate the thickness of the layer of coal, and consequently the time it ought to remain on the table. The sixth opening is used for removing the coal that is sufficiently dried.

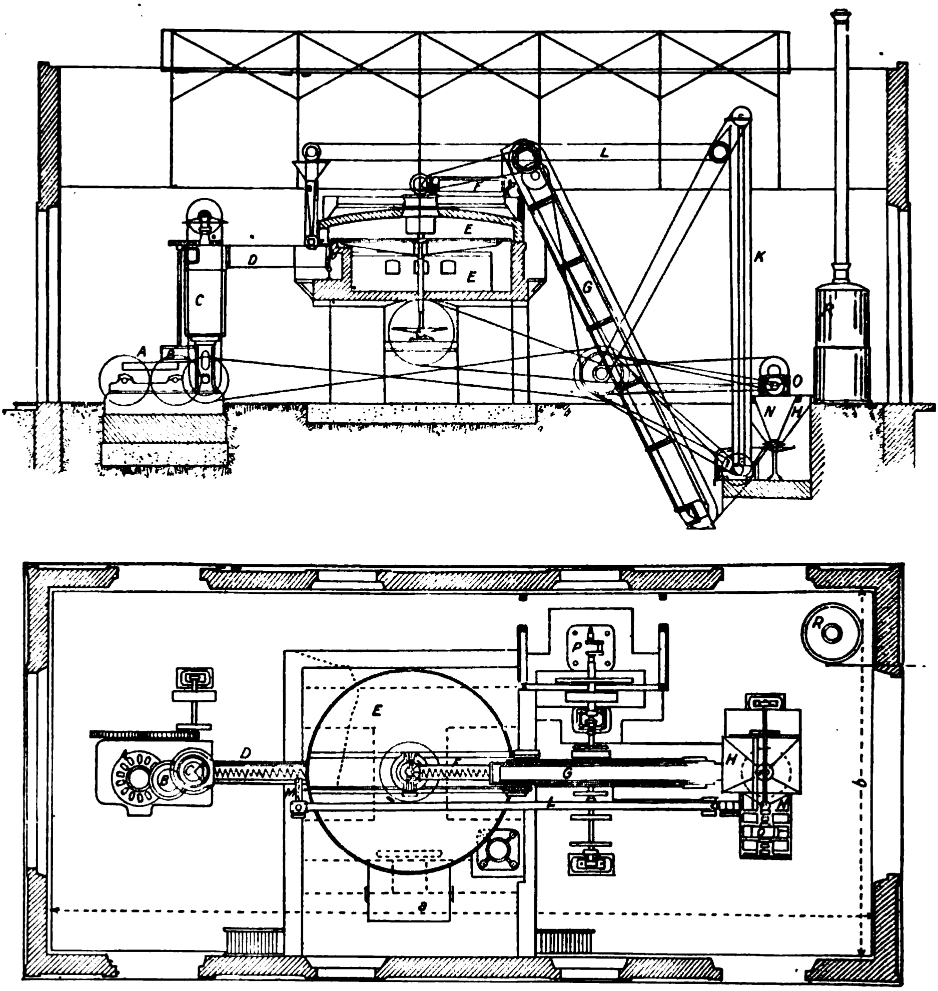

FIG. 7.—Plan of complete plant, with oven.

A. Briquette machine.
B. Distributer.
C. Steam malaxor.
D. Mixing screw.
E. Drying oven.
F. Conducting screw for coal.
G. Chain of buckets.
H. Coal hopper.
I. Coal crusher.
K. Brai elevator.
L. Brai feeder.
M. Brai feeder.
N. Brai sieve.
O. Brai crusher.
P. Engine.
R. Boiler.

The advantages of the drying oven are easily demonstrated.

Let us suppose the coal sent to the agglomerating works contains 10 per cent of water, which is very frequent. To reach the press in good condition it ought not to contain more than 3 per cent; it is necessary, consequently, to evaporate 7 kilos (15.4 pounds) of water per 100 kilos

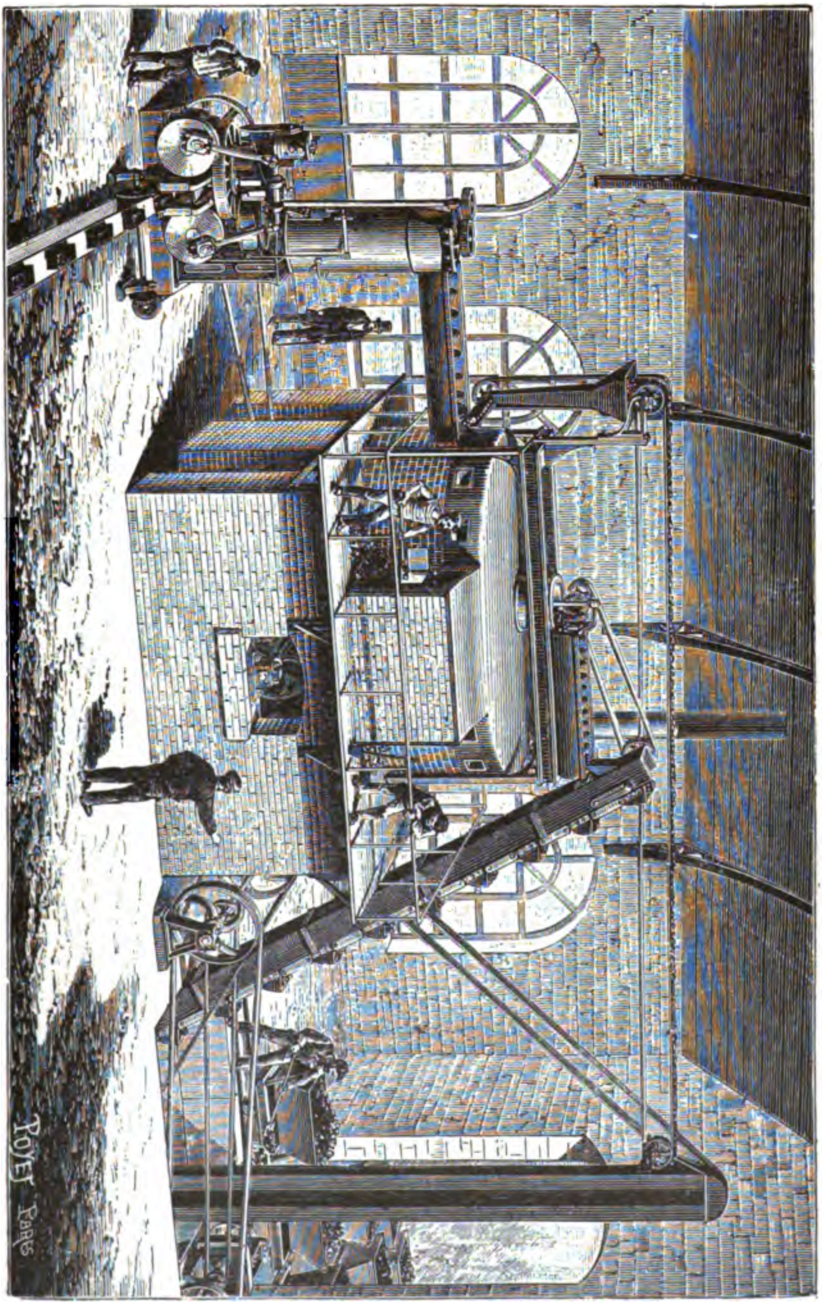

FIG. 8.—General view of plant.

(220.4 pounds) of coal. These 7 kilos (15.4 pounds) of water, to be evaporated at 100° C., demand, in supposing the water to be at 15° C., 7×(85+537), or 4,354 calories. If steam at 400° is brought into the malaxor, a number of calories can be disposed of per kilo which would

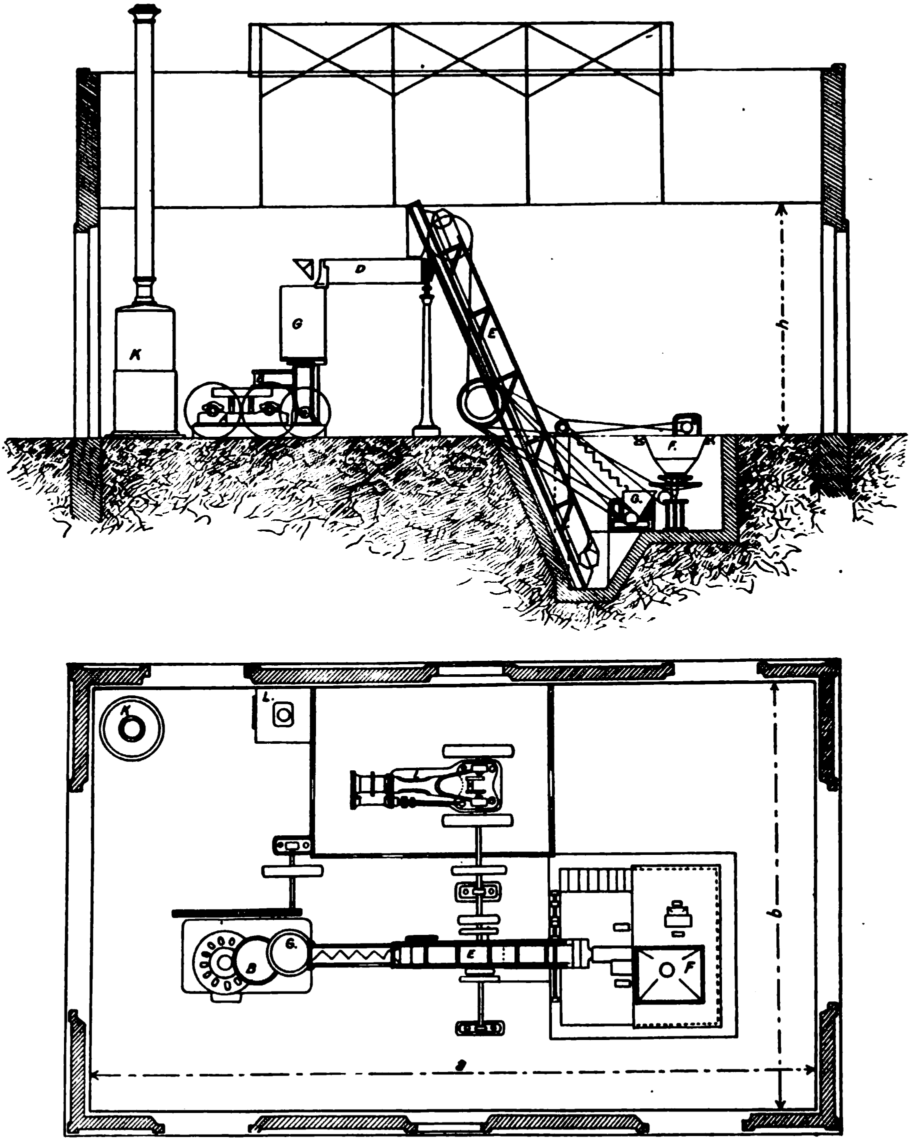

Fig. 9.—Agglomerating plant without drying oven.

attain 0.305×300=92, and to vaporize 7 kilos (15.4 pounds) of water should be employed $\frac{4354}{92}$=47 kilos 500 grams (104.7 pounds) of steam at 400°.

In taking into account the excess heat, 11 or 12 kilos of coal at least are necessary to produce these 47 kilos 500 grams (104.7 pounds) of steam, or eight or nine times more than required by the revolving platform.

Size of the buildings.

Sides.	Machines of— 3 kilos (6.6 pounds).	Machines of— 5 to 6 kilos (11 to 13.2 pounds).	Machines of— 9 to 10 kilos (19.8 to 22 pounds).
	Feet.	*Feet.*	*Feet.*
A	70	84	90
B	30	36	40
C	18	21	24

Production per day.

Machines of—	Tons.[a]
3 kilos (6.6 pounds)	60
5 to 6 kilos (11 to 13.2 pounds)	100
9 to 10 kilos (19.8 to 22 pounds)	150

It has been already said that desiccation of the coal was necessary to obtain good briquettes, but where the coal is already dry (3 per cent only of water), the drying oven is not indispensable, and in such cases the same firm (Biétrix & Co.) have arranged for works, like fig. 9, without a drying oven.

Principal types of briquettes.

Number of briquettes per stroke of piston.	Size in inches.	Weight.	Per hour.
Machine No. 1.			*Tons.*
1 briquette	9 by 4½ by 4	3 kilos (6.6 pounds).	5.5
4 briquettes	3 by 2 by 4	500 grams (1.1 pounds).	4.0
3 briquettes	4½ by 2½ by 4	700 grams (1.5 pounds).	4.5
1 briquette, perforated, 8 holes	6½ by 5 by 2	1 kilo (2.2 pounds).	1.8
1 briquette, perforated, 10 holes	6½ by 5 by 2	1 kilo (2.2 pounds).	1.8
2 briquettes, perforated, 4 holes	4½ by 4½ by 2	500 grams (1.1 pounds).	1.8
Machine No. 2.			
1 briquette, solid	10 by 6 by 4½	5 kilos (11 pounds).	9.5
2 briquettes, solid	5½ by 5½ by 4½	2 kilos 500 grams (5.5 pounds).	9.0
4 briquettes, solid	4¾ by 2½ by 4½	1 kilo (2.2 pounds).	7.5
6 briquettes, solid	3 by 2½ by 4½	650 grams (1.4 pounds).	7.0
2 briquettes, perforated, 7 holes	5¾ by 5¾ by 2	1 kilo 100 grams (2.4 pounds).	4.0
4 briquettes, perforated, 2 holes	4¾ by 2½ by 2	500 grams (1.1 pounds).	3.5
Machine No. 3.			
1 briquette, solid	12 by 6 by 4½	9 to 10 kilos (19.8 to 22 pounds).	15.0
2 briquettes, solid	7½ by 5½ by 4½	4 kilos (8.8 pounds).	12.0
3 briquettes, solid	7 by 4 by 4¾	2 kilos, 500 grams (5.5 pounds).	10.0

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[a] 2,204 pounds.

Cost price of the manufacture of briquettes.

	Machines of—		
	3 kilos (6.6 pounds).	5 to 6 kilos (11 to 13.2 pounds).	9 to 10 kilos (19 to 22 pounds).
Annual expenses for 300 working days.			
Labor:			
1 foreman machinist, at $1.15 or $1.35	$345	$405	$405
1 fireman, at 77, 87, and 96 cents	231	261	288
1 fireman for oven, at 96 cents and $1.06	288	318	318
Helpers, 2, 3, and 4, at 58 cents per day	348	522	693
Raw material:			
Coal for engine and drying oven, at $2.90 per ton	1,158	1,658	2,608
Brai (5 to 6 per cent), $13.50 per ton	6,348	11,464	17,823
Sundries (repairs, oil, etc)	579	868	1,158
Total	9,297	15,496	23,293
For an annual production in tons of	17,400	28,500	44,300
Or the cost price per ton, less the coal	$0.58	$0.54	$0.53

The above cost price can not be considered as absolute, for the cost of labor and that of the brai are very variable; nevertheless the above table may constitute a basis on which to calculate.

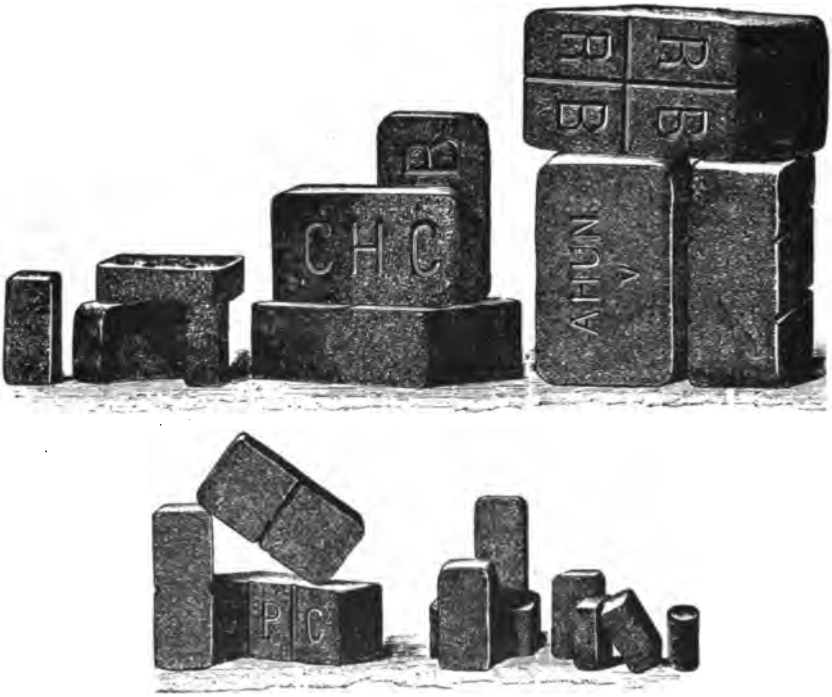
The briquettes are generally rectangular in shape, square (perforated), ovoid (very small, like hen's eggs), or cylindric, about 4 inches thick and 12 long. These latter are employed on the railways, while the other forms are appreciated for domestic use and certain industries.

Prices of the machines, ovens, and accessories.

Machine No. 1, for briquettes of 3 kilos (6.6 pounds):	
Agglomerating machine, production 50 to 55 tons	$4,825
Drying oven	1,540
Chimney of oven	115
Malaxor and screw for mixing	715
Chain of buckets and distributers	1,090
Crushers (2), one for coal the other for brai	770
Transmission of movements to above apparatus	752
Horizontal boiler	840
Engine, 30 to 35 horsepower	1,254
Sundries	445
Total	12,345
Machine No. 2, for briquettes of 5 kilos (11 pounds):	
Agglomerating machine	6,755
Drying oven	2,316
Chimney of oven	135
Malaxor and screw	1,447
Chain of buckets and distributers	1,370
Crushers (2)	965
Transmission of movement	1,196
Horizontal boiler	1,447
Engine, 60-horsepower	1,737
Sundries	600
Total	17,968

Machine No. 3, for briquettes of 10 kilos (22 pounds):

Machine	$8,685
Drying oven	2,316
Chimney of oven	135
Malaxor with screw	1,930
Chain of buckets and distributers	1,582
Crushers for coal and brai (2)	1,447
Transmission of movement	1,296
Engine, 50 to 60 horsepower	3,136
Boiler	2,277
Sundries	810
Total	23,518



Principal types of briquetts.

The heating value of the briquettes differs little from that of the coal, as the small addition of brai (6 per cent) increases it but slightly; it is consequently about the same as that of the coal, which is estimated at about 6,500 calories, or in other words, 1 kilo of coal is sufficient to vaporize 6½ liters of water.

The price of the briquettes sold to the public varies between $4.82 and $5.40 per ton.

The quantity of briquettes turned out daily in this region amounts to about 700 tons, or about 200,000 tons annually.

Hilary S. Brunot, *Consul.*

St. Etienne, *December 8, 1902.*

PETROLEUM BRIQUETTES IN FRANCE.

The following reports by Consul Brunot, of St. Etienne, are reprinted from Consular Reports Nos. 258 and 260 (March and May, 1902).

Petroleum briquettes have been manufactured in various ways in different countries, notably in Russia, France, and the United States, as a fuel for steamships and certain industries where rapid production of heat is desirable.

The advantages of such a substitute for coal are readily apparent—less storage room, complete combustion, etc. It is surprising that petroleum has not been utilized more generally in this form. The objections are that the briquettes injured the boilers after a short time, by reason of some chemical action produced by combustion; further, the blocks did not keep their form under the action of the heat, but fell through the fire box in a liquid state, and the price is stated to be two-thirds more than that of coal.

A company has recently been formed at St. Etienne for the manufacture of petroleum briquettes which claims to have obviated all the objections except that in regard to price. The advantages of the product are set forth as follows:

> The briquette is composed of 97 per cent of petroleum and 3 per cent of hydrocarbon. The volume being equal, it weighs only half as much as coal and gives but from 2 to 3 per cent of residue; it produces no slag; it does not "run" when lighted and keeps its form like coal; it burns without odor and without smoke; it may be wetted with impunity, losing none of its properties; it consumes without explosion or sparks and yet with a bright and long flame; it may be kept indefinitely without deterioration. By this process a degree of saponification is obtained by which the briquettes are rendered unchangeable even to the extent that if a projectile should enter a ship's bunker filled with this fuel, there would be no danger whatever of explosion, the effect being the same as in the case of ordinary coal.
>
> The average heating power is from 12,000 to 14,000 calories, and the briquettes can be employed in any fire box or in any grate for domestic purposes.
>
> The manufacture of these briquettes is very simple and requires but little machinery. If necessary, the petroleum contained therein can be recovered with a loss of only 5 to 7 per cent.

The same company manufactures what are called mixed briquettes—half coal and half petroleum,—but if these are cheaper than the former, they present less advantages, from the fact that the density is greater and the heating power is only 9,000 calories. A steamer carrying 8,000 tons of coal would require 3,500 tons of mixed briquettes and only 2,500 of the pure petroleum briquettes.

The petroleum used by the company comes from the United States, and only the refined quality is employed. When I asked why the managers did not employ the Russian oil, they replied that while the price was the same (12 francs per 100 kilograms, or $2.31 per 220 pounds), the latter was less refined, as it contained more greasy matter.

A short time ago the company submitted the briquettes to the Government and after several experiments a trial order for 150 tons was given, to be delivered as quickly as possible. This order is now being executed.

A group of capitalists at Marseilles is about to buy the invention of the St. Etienne company and form a company with a capital of 4,000,000 francs ($772,000), to establish manufactures at Marseilles, Suez, Batum, etc. The selling price of the briquettes will be about 8 francs per 100 kilograms ($1.54 per 220 pounds).

As an indication of the interest the French Government is taking in this new fuel product, it has ordered that all the petroleum used in filling its order shall be admitted free of custom duties.

Owing to numerous inquiries received, I think it well to supplement my former report on the subject of petroleum briquettes by some additional information in regard to their manufacture and uses.

The briquettes are mostly composed of petroleum, crude or refined, and possess all the advantages of coal and petroleum without the inconveniences of either. They weigh one-half as much as coal; leave only 2 to 3 per cent of residue; do not form clinkers; do not melt or run; burn without smell or smoke; do not absorb moisture; will float on the water (density, 0.850); do not explode and are not liable to spontaneous combustion under any circumstances; will keep indefinitely, retaining all their qualities of combustion; give off a very white flame 8 to 10 inches high; produce twice as much heat as coal; can be used in any kind of furnace, and are easy and agreeable to handle.

MODE OF MANUFACTURE.

The manufacture of these briquettes is very simple. They are made without heat and no danger attends the operation.

The petroleum is placed in one tank and the chemicals in another, and both are allowed to run into a mixing apparatus, when the chemical combination is formed immediately. The product is then passed to a press, where the desired form is given. The briquette is now ready for use, or it can be stored. The pressure used in molding the forms is about 300 pounds per square inch.

As will be seen, the mode of procedure is very simple and the necessary plant inexpensive, requiring only tanks, mixer, and press, with small motor power for the latter two. Works erected at a cost of, say, $20,000 would turn out several hundred tons a day.

The use of this chemical combination as a binder and enricher solves a difficulty frequently encountered in the making of coal-dust or sawdust briquettes.

USES AND ADVANTAGES.

The petroleum briquette is especially suitable for torpedo boats and as emergency fuel on larger vessels; for its density, as compared with coal, will allow a steamer to accomplish twice as great a distance as with the same volume of coal. If a boat, for instance, takes 2,000 tons of coal to steam a certain number of miles, it would require only 1,000 tons of petroleum briquettes to cover the same distance; consequently that vessel would be able to carry 1,000 tons more fuel or an equivalent amount of cargo.

A boat using petroleum briquettes could get up steam in one-fourth or one-third of the time required by coal. Further, a boat steaming with petroleum briquettes would show no smoke, which is important to naval vessels under many circumstances.

Petroleum briquettes can be used for any kind of domestic or industrial work without changing the furnaces. For fire engines, where the rapid raising of steam is of great importance, these briquettes would seem to be the ideal fuel.

As to the cost of manufacture, it appears that the oil is the greatest item, that of the other ingredients labor and machinery, being comparatively little.

It is impossible for me to comply with the request for samples received from numerous American correspondents, as the inventors will give none. Neither can the character of the chemicals used nor the exact process of mixing be learned. However, I may aid those interested by giving the address of the recently appointed American agent of the company, viz, Mr. King, 23 boulevard des Italiens, Paris.

After the careful experiments made by French authorities, the fact that these briquettes are likely to be adopted by the Government would indicate that they are considered a success.

As to the price, it is estimated that they could be sold for 8 francs per 100 kilograms ($1.54 for 220 pounds)—in other words, $14 per short ton.

GERMANY.

REPORT FROM CONSULATE-GENERAL AT BERLIN.

Among the several branches of German industry which deserve the attention of Americans by reason of their economy, their recovery or utilization of some raw material which exists unused in our country, or because they involve the most intelligent application of scientific knowledge to technical processes, may be reckoned the manufacture of briquettes from brown coal, peat, and the dust and waste of coal mines. Briquettes form the principal domestic fuel of Berlin and other cities and districts in Germany. They are used for locomotive and other steam firing, and are employed for heating in various processes of manufacture. For all these uses they have three tangible advantages. They are clean and convenient to handle, they light easily and quickly, and burn with a clear, intense flame. They make practically no smoke and are, withal, the cheapest form of fuel for most purposes.

Like most other important German industries, the briquette manufacture is controlled by a syndicate which includes among its members thirty-one firms and companies, or more than nine-tenths of all the producers in this country, and regulates the output and prices for each year. From the official report of the syndicate for 1901, which has recently appeared, it is learned that the total output during last year was 1,566,385 tons, to which is to be added the product of makers outside the syndicate, consumed at works, small retail sales, etc., making a grand total of 1,643,416 tons.

The average selling price in large quantities was 13.33 marks ($3.16) per ton, against 12.27 marks ($2.92) for the year previous, so that notwithstanding the general relaxation of industrial activity and the diminished pressure upon the coal supply, the ruling price was the highest that had been realized since 1891. Of the 1,566,385 tons sold by the syndicate last year 749,208 tons were taken by the German railways, 124,380 tons were sold to retailers, 497,136 tons were sold to factories and works of various kinds, and 149,089 tons, or 9.8 per cent, were used by German merchant steamers and the navy or exported to the German colonies or neighboring European countries.

The following tabulated statement shows the production, the sales of the syndicate, and the mean price per ton for the past eleven years:

Year.	Production.	Sales of syndicate.	Price per ton.	
	Tons.	*Tons.*	*Marks.*	
1891	482,495	202,780	12.67	$3.02
1892	533,075	516,508	10.47	2.49
1893	694,025	645,144	9.08	2.16
1894	745,414	719,258	8.82	2.10
1895	796,363	780,185	9.07	2.16
1896	830,985	817,300	9.34	2.22
1897	943,732	934,221	9.99	2.38
1898	1,078,113	1,245,269	10.22	2.43
1899	1,580,816	1,485,130	10.66	2.34
1900	1,563,928	1,519,811	12.27	2.92
1901	1,566,385	1,560,230	13.33	3.17

The syndicate produces to a large extent briquettes made from coal screenings, which require a matrix or binder of some plastic, inflammable material, and for this purpose 116,956 tons of mineral pitch were used, which cost on an average about $10.25 per ton delivered.

It need hardly be said that the general use of briquettes for domestic fuel in a large, densely built city, as well as for generating steam in a number of electric generating plants and factories, must have a decided and beneficial influence in reducing the smoke, which in most American cities has become a persistent and oppressive nuisance. Berlin, although a busy manufacturing city, ranks as one of the cleanest and best kept in Europe. One of the first things usually noticed by American and English travelers visiting the German capital for the first time is the absence of that cloud of dusty smoke that overhangs so many towns and cities in our country. The reason for this lies in three facts: The preponderant use of coke and briquettes, which are practically smokeless; the skillful scientific construction of boiler furnaces and chimneys, and, finally, the high standard of skill that is taught and enforced among firemen who stoke furnaces with coal for steam and manufacturing purposes. It is not every strapping laborer who can shovel coal who is permitted to stoke a boiler furnace in this country. Before he can assume such a charge he must be taught the theory and practice of economical, scientific firing, by which the coal is distributed in such manner and quantity over the grate surface as to secure the most perfect combustion of its volatile elements. The Silesian coal used here in most large steam plants and factories is rich in bitumen and would rank below many of the bituminous coals of the United States, and yet the long, dense, trailing clouds of smoke from mill and factory chimneys which are so familiar a sight in many American cities are rarely seen in this section of Germany, where the indiscriminate shoveling of raw bituminous coal into the steam and other furnaces is considered an ignorant and wasteful proceeding.

Coke making in retort ovens, by which every element is saved and bituminous coal converted into smokeless coke and gas, is another important factor in German fuel economy and abatement of the smoke nuisance. If American municipalities beyond the economic range of anthracite are ever emancipated from their present vassalage to the smoke incubus, it will be through the enforced use of one or more of three forms of prepared fuel, viz, coke and fuel gas made in closed ovens from bituminous coal, and briquettes made from lignite, peat, and other inferior materials by processes which have been invented, tested, and proven to be efficient by the older and more economical countries of Europe.

FRANK H. MASON, *Consul-General.*

BERLIN, *July 25, 1902.*

GERMAN PROCESSES AND MACHINERY FOR BRIQUETTE MANUFACTURE.

In a recent report from this consulate[a] some account was given of the use of briquettes made from brown coal, carbonized peat, coal dust, etc., as domestic and steam fuel in Berlin and other German cities, and the wholesome effect of such fuel, together with coke and fuel gas, in preserving municipalities in this country from the smoke nuisance which has become so serious an inconvenience to many industrial towns and cities in the United States. That report, having been published at a time when public attention had been especially drawn to the general subject of fuel by the prolonged miners' strike in Pennsylvania and the consequent scarcity and increased cost of anthracite coal, has caused an unusual number of inquiries for further and more specific information concerning the extent of the briquette manufacture in Germany, the kinds of machinery employed, where and by whom manufactured, the raw materials consumed, cost of plant with a specified daily capacity, and, finally, the names and addresses of briquette manufacturers in this country who would probably answer technical questions on this subject which might be submitted by correspondence. With a view of covering as far as practicable the general range of these inquiries, the present supplemental statement is submitted.

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[a] See ante.

There were in operation in Germany at the close of 1900 89 manufactories of fuel briquettes, some of which—for example, the "Hercules," the "Seven Planets," and the "Tiefbau," at Dalhausen, on the Ruhr—produce each more than 100,000 tons annually. Briquette works are divided, in respect to the material employed, into two general classes, viz, those which make briquettes from brown coal (lignite) or carbonized peat, with or without the addition of a bituminous matrix or binder, and, second, those which use as a basic material coal dust or slack—the waste of soft-coal mines. Of the latter class, Messrs. Franz Haniel & Co., of Ruhrort on the Rhine, who have works at several points along the Rhine, are representatives. The great Gruhl establishment at Brühl, the "Donatus" works at Liblar, near Cologne, and the Thuringian Aktiengesellschaft, at Deuben, near Halle, are typical examples of factories which make briquettes from brown coal, which is abundant and cheap in many sections of Germany. In the last-named establishment no matrix or binder is used. The lignite is crushed, moistened with water to the consistency of mortar, then passed through the machine, which, by compression under heat, develops the bitumen in the material and renders the mass so plastic and adhesive that it molds rapidly into smooth, glistening briquettes of a black or dark-brown color, which are practically smokeless and leave after combustion a reddish-brown ash. All processes of this kind are based upon the fact that lignite is a vegetable coal of more recent formation and, therefore, less perfectly carbonized structure than anthracite or bituminous coals, has lower caloric value, and requires to be compressed and further carbonized by artificial means. Turf or peat is a still more recent formation, and requires proportionately more artificial preparation to produce a high-class fuel; hence the several more or less successful patented processes for carbonizing peat into so-called peat coal, an artificial product which can be either used in irregular lumps or molded into briquettes.

From what has been previously reported on this subject it will be apparent that in all that concerns the manufacture of briquettes from brown coal or from the slack and waste of bituminous coal mines the processes employed in France and Germany have long passed the experimental stage and become a standard commercial industry. If Americans are really interested in the subject, there is no need that they should risk any large sums of money in uncertain experiments. They have only to study the machinery and methods employed in European countries, compare their crude materials with those found and used here, and they can thus start at the point of technical knowledge which Europeans have reached after many years of experience. When, some ten years ago, the attention of American iron makers was called to the German system of making blast-furnace coke in retort ovens, which saves the valuable volatile elements of the coal, it was thought worth while by certain of them to bring over two carloads of Connellsville coal to be coked as a test by the German process. The complete success of that experiment decided the introduction of the standard German type of coking oven into the United States.

Something similar, it would seem, might profitably be done with the materials which Americans have not yet succeeded in converting into satisfactory briquettes. There are experienced engineers and a dozen manufacturers of briquette-making machinery who would gladly cooperate in these tests and would furnish machinery adapted to working the material thus technically defined. Upon a basis of such tests, plans and estimates could be obtained for the erection of plants in the United States with specified daily capacity. Among the builders of briquette-making machinery in Germany, the following may be cited as of standard reputation, the first two named being more specially concerned with apparatus for making briquettes from coal dust and slack, while the latter build machinery for briquette making from brown coal and peat:

The Düsseldorfer Eisenwerke, A. G., No. 55 Bruch Strasse, Düsseldorf.
Schichtemann & Kraemer, Dortmund.
Tigler Maschinenbau Gesellschaft, Meiderich-on-Rhine.
Röhrig & Koenig, Magdeburg-Ludenburg.
Maschinenfabrik Buckau, 82 Schönebecker Strasse, Magdeburg.
Zeitzer Maschinenbau Gesellschaft, Zeitz, Saxony.
E. Fietsch & Co., Thurm Strasse, Halle a. S.

Mr. Robert Grimshaw, an American engineer of large experience on the subject, whose address is at 9 Warmbücher Strasse, Hanover, may be consulted personally or by correspondence by those who may desire technical information as to machinery or methods, the cost of plants, etc.

PATENTED MACHINERY FOR MAKING PEAT BRIQUETTES.

It remains to speak of several recently invented and patented processes by which artificial coal or briquettes have been more or less successfully produced from peat by the application of machinery or methods not yet fully established on an industrial basis. Inevitably, a description of such a process must rest to a greater or less extent on the specifications and claims of its inventor, and it will be understood that in the following brief citations no opinion or estimate is offered of the practical value of the methods described.

The Stauber process for drying moist substances was first brought into prominent notice in connection with peat-coal manufacture in 1901, when the Imperial testing station, at Charlottenburg, announced, as the result of experiments made with peat briquettes made by the Stauber system, that they contained 45.14 per cent of fixed carbon, 4.54 per cent hydrogen, 29.34 per cent oxygen, and 9.09 per cent ash and had a thermal value of 3,806 calories. The Stauber system as thus applied includes a process for rapidly drying the moist peat by means of heated and compressed air within a closed chamber or channel communicating with conduit pipes in such manner that heated air can be forced through the drying channel and cold air through the outlet pipe, the effect being that the cold air quickly absorbs the hot, saturated air out of the drying chamber and condenses it in the conduit pipes, thus greatly stimulating the process of evaporation by which the peat is dried. Peat in its raw state contains from 70 to 85 per cent of water, and in the humid climate of northern Europe is usually a very difficult material to dry. It is claimed for the Stauber method that it reduces the moisture to 18 or 20 per cent quickly, effectively, and, what is important, without changing the chemical composition of the peat or in any way adding to it. The drying machine is in the boiler form (cylindrical) and of a size to conveniently produce 5 tons of dried peat per day. In a large plant this unit would be simply repeated, as a number of machines can be worked with air currents generated by the same engine. A large plant for working the process is now in course of erection near Königsberg, on the Baltic Sea, and another is already in operation at Ostrach, in Wurttemberg. A sample briquette from the latter establishment and a sample of coal made from peat prepared by the Stauber process are transmitted as exhibits with this report.[a] The peat coal can be used for locomotive or other fuel raw, or it can be coked, and produces a coke wholly free from sulphur and as valuable as charcoal for certain industrial purposes.

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[a] Filed for reference in the Bureau of Foreign Commerce.

Estimates furnished by the company give the cost of a plant capable of turning out 50 tons of peat briquettes per day as follows:

	German currency.	United States currency.
	Marks.	
Buildings	60,000	14,280
Machinery	75,000	17,850
Steam engine and fixtures	15,000	3,570
Means of transporting material and product	15,000	3.570
Total	165,000	39,270

A second process is that invented by Mr. F. Schülke, of Bach Strasse, Hamburg, the salient feature of which is that the turf or peat used is cleaned of roots, stones, etc., then liquefied by water and pumped through a pipe line several miles to the works, where, as claimed by the inventor, it is leached and converted by heat and pressure into briquettes at a net cost of $2 per ton, or into artificial coal, having a thermal value of 6,250 calories, at a cost of $2.50 per ton. It is understood that a large plant is in process of erection on the northern coast of Germany for the utilization of this method, but as to the actual condition of the enterprise or the practical value of the process on an industrial scale no exact information is at hand.

The Schoening-Fritz process for making artificial coal and briquettes by carbonizing dried peat is an elaboration by a German engineer of the system invented by Schoening and used with more or less success at Stamsund, in Norway. The German patent is owned by a corporation known as the Deutsche Torfkohlen Gesellschaft, which has its office in Berlin and a small plant at the suburban town of Halensee, where two machines of small capacity—one worked by hand, the other by power—have been set up for experimental purposes. A collection of samples of artificial coal made by this process is transmitted as an exhibit with this report.[a] They are made from ordinary brown peat, of which there are thousands of square miles of deposits in the United States, and will be found coal black in color, firm in structure, glazed on the surface, clean as wood to handle, easily kindled, and practically smokeless when burned in an ordinary grate or stove. Drs. Brockhoff and Ehrecker, of Magdeburg, who as experts analyzed samples of coal made by this process, reported that it contained 68.03 per cent of fixed carbon, 4.98 per cent of hydrogen, 5.34 per cent of moisture, 19.89 per cent of oxygen, and 1.76 per cent of inorganic ash and had a thermal value of 6,205 calories. The process consists in compressing dried peat between hot rollers, by which it is simultaneously carbonized and transformed into coal. According to the statement of the inventor, 1 ton (20 hundredweight) of dried peat, costing in Germany about 1.60 marks (38 cents) will produce from 12 to 15 hundredweight of peat coal. To make 1 ton of coal, the cost is 2.67 marks (63 cents) for dry peat; adding 1 mark for labor, the net cost of material and labor for producing a metric ton of peat coal would be 3.67 marks, or 87½ cents. These, be it remembered, are the estimates of the owners of the process, based upon expert tests and laboratory experiments. They are given as notes of progress in the manufacture of artificial fuel in Germany, but they will have a practical interest only when the process has been successfully and continuously worked on a commercial scale.

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[a] Filed for reference in the Bureau of Foreign Commerce.

Of the processes actually employed, the value of which has been fully established by experience, one of the most interesting is that invented by Mr. C. Schlickeysen, of Rixdorf-Berlin, and practically operated there, at Munich, and other places. The peculiar feature of this system is that by it black, dense briquettes of high caloric value are made from peat without the application of heat—simply through the action of kneading and drying.

The following illustration shows a machine of this type in operation, the raw turf coming up by an endless belt or elevator running in the long sloping trough which leads to the peat bed—for these machines are portable and are generally carried on temporary railway tracks, laid so as to enable the machine to follow the point of excavation as the peat bed is gradually exhausted. From the summit of the elevator the raw material drops into the machine, where it is cut, torn, kneaded, and compressed into about two-thirds of its original bulk, and delivered at the end of the machine in cubes of any desired size, which are first dried until they lose about two-thirds of their water, when the drying process is generally completed by artificial means. The principle upon which this machine operates depends upon the fact that peat in its natural condition contains about 80 per cent of water, of which four-fifths is held in mechanical suspension between the hairy vegetable fibers of which the peat is composed, while the remaining one-fifth is contained in the fibers themselves, each of which is a minute hollow tube, in which water is held by capillary attraction. In the ordinary process of drying peat the material is cut into cubes and laid in the air, where most of the water held between the fibers soon leaches out by gravity or evaporates. That which is contained inside the fibers is much more difficult to expel, and for this purpose the fibers must be cut, torn, and compressed until they give up their liquid contents. Nine cubic feet of raw peat is thus condensed by the machine into 6 cubic feet of prepared peat, which still contains about 40 per cent of water, and this is further dried and compressed into 1 cubic foot of black, dry, fossil-vegetable stone of about 1.5 specific gravity, which, like the samples herewith transmitted,[a] can be sawn, planed, and even polished like cannel coal.

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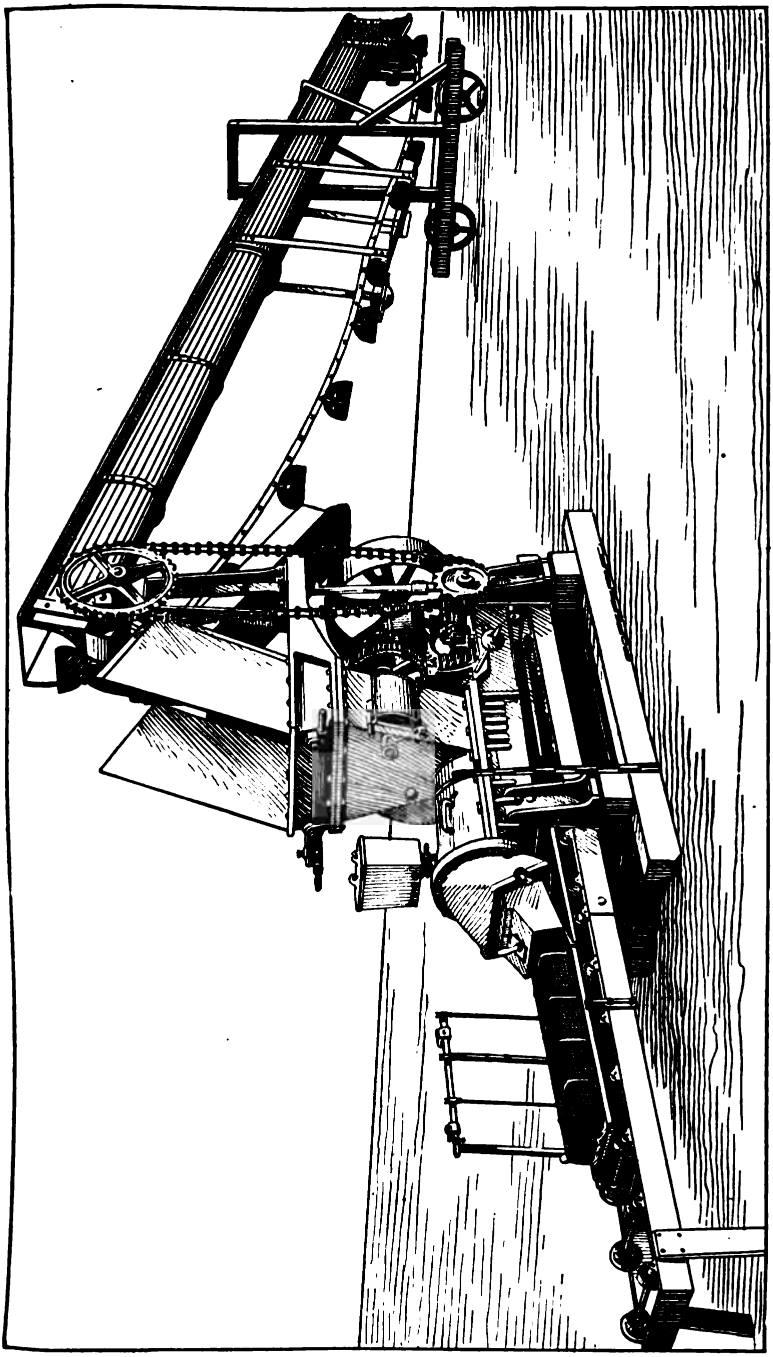
[a] Filed for reference in the Bureau of Foreign Commerce.



Machine for making briquettes from peat.

Turf briquettes ordinarily contain about 66 per cent of inflammable elements, the remainder being made up of inorganic ash and water. They are thus inferior as fuel to briquettes made from brown coal, which average 70 per cent or more of inflammable matter. Both represent in their present form the utmost that science has been able to do in utilizing inferior and otherwise almost worthless materials to supplement and eke out the insufficient coal supply of European countries.

FRANK H. MASON, *Consul-General.*

BERLIN, *September 13, 1902.*

GERMAN BRIQUETTE MACHINERY FOR AMERICA.

The correspondence received during the past month from nearly every State and Territory of the Union, making further inquiry concerning the machinery and processes employed in Germany for making fuel briquettes from lignite, peat, and coal dust, indicates that public interest in the whole subject of utilizing the hitherto wasted or neglected fuel material, so abundant in America, has been thoroughly aroused. There are in new England, western New York, Michigan, Illinois, Wisconsin, Oregon, and Washington vast beds of peat which have been thus far hardly explored. There are in the Dakotas and the Gulf States large deposits of lignite and material midway in character between lignite and peat, and there are in all the coal-mining States enormous quantities of bituminous dust and anthracite culm, all of which may by the employment of modern machinery and processes be added to the fuel supply of our country.

As has been stated in these reports, this is an industry in which the first tentative efforts made in the United States have generally failed, but which has been developed in Germany, France, and Belgium by long, careful, scientific experience into an important and successful system of production. There is no reason why any American operator or mine owner should risk a dollar in vague or hazardous experiments; he has only to ascertain by expert inquiry what his crude material contains—whether or not it is adapted to profitable conversion into briquettes, and if so, by what processes and machinery it can be most effectively treated. With a view of answering concisely the latest inquiries on this subject and simplifying to some extent the practical proposition, the following résumé of the briquette manufacture, as it exists in Germany is respectfully submitted.

German briquette factories are divided, in respect to the crude material employed, into two general groups—those which make household briquettes from brown coal (lignite) or carbonized peat, and those which produce the so-called "industrie briquettes," using as basic material coal dust or "slack," the waste of bituminous coal mines.

I. Household briquettes, as made in Germany from brown coal, peat, and to a small extent from anthracite dust, are used for grates, heating stoves, cooking stoves, and ranges, and constitute the principal household fuel of Berlin and other German cities. They are clean to touch, kindle readily, burn with a clear, full flame, and are cheaper in Berlin, ton for ton, than anthracite or good bituminous coal. They are made largely from brown coal, in factories located mainly in Silesia, Saxony, and the Rhine provinces, and united in a syndicate which controls the output, regulates the prices, and looks after the general welfare of the industry.

Working model of a brown-coal (lignite) briquette factory.

Machinery for the manufacture of briquettes from lignite is made by several large establishment, among which may be cited the Zeitzer

Eisengiesserei, at Zeitz, in Saxony; the Maschinen Fabrik Buckau, at Magdeburg, and the Königin Marienhütte, at Cainsdorf, in Saxony.

The first illustration (see foregoing page) shows a miniature working model of a brown-coal briquette factory which was exhibited by the Zeitz establishment at the recent exposition in Düsseldorf. It exhibits in condensed form the essential elements of such a plant—the machinery for pulverizing, elevating, drying, and finally compressing the material into briquettes.

There are in Germany 439 brown-coal mines, which produced last year 44,211,902 tons of lignite, valued at $46,042,500, or a little more than $1 per ton. Of this whole number of mines 181 have each from 1 to 6 briquette factories, in each of which from 1 to 10 presses are employed. The whole brown-coal briquette industry of Germany includes 286 factories, with a total of 691 presses. Statistics of the total yearly product are not accessible, but from the fact that a single press turns out from 50 to 90 tons per day, it will be readily inferred that the annual output is enormous. They are the standard household fuel throughout a large portion of this country, and are besides largely used for firing steam boilers, especially in cities where their cleanliness and freedom from smoke and dust are highly esteemed. The standard household briquette is about 8 inches in length by 4 inches in width and 2 inches thick, and is retailed and delivered in Berlin at prices ranging from $2 per 1,000 in summer to $2.50 in winter.

The second illustration (p. 88) shows a brown-coal briquette factory, with three presses of horizontal type.

II. Industrial briquettes are used in Germany for firing locomotives and other steam boilers, for smelting in reverberatory furnaces, and for many other kinds of industrial heating. They are made of bituminous-coal dust, held together by a matrix of mineral pitch; that is, coal tar derived from retort coke ovens or gas manufacture, and from which the benzole and other valuable elements have been eliminated. Pitch of this quality costs in this country from $10 to $12 per metric ton.[a] The percentage of matrix necessary to be used varies greatly with the "fatness"—i. e., richness in bituminous elements of the coal itself. Slack from very fat coal will work into briquettes with an addition of two or three per cent of pitch, while leaner grades may require 6 to 8 or even 10 per cent, the latter proportion being sufficient, at the present cost of pitch, to render such coal unprofitable for briquette-making purposes. Briquettes made from bituminous slack, although not smokeless, are much more nearly so than ordinary bituminous coal. When burned in locomotives or any well-constructed boiler or other furnace with a good draft, they create only a thin, translucent mist, which contains relatively little soot, and is very different from the inky clouds that roll up from most factory chimneys where soft coal is shoveled indiscriminately into the furnaces. The one notable defect of such briquettes is that the mineral pitch, which is used as a binder, contains more or less creosote; this renders dust and fumes from such fuel acrid and sometimes irritating to the skin when confined in a close, hot boiler room. Soft-coal briquettes are made from the dust and waste of mines, and, when the composition of the coal is such as to permit a low percentage of binder to be used, they are the cheapest and easiest kind of briquettes to produce. They are made in machine presses more or less similar to the one shown in

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[a] 1 metric ton=2,205 pounds.

Brown-coal briquette factory, with three presses of horizontal type.

the third illustration (p. 90), which is a typical machine of the Zeitz pattern, with a capacity of 90 tons of briquettes per day.

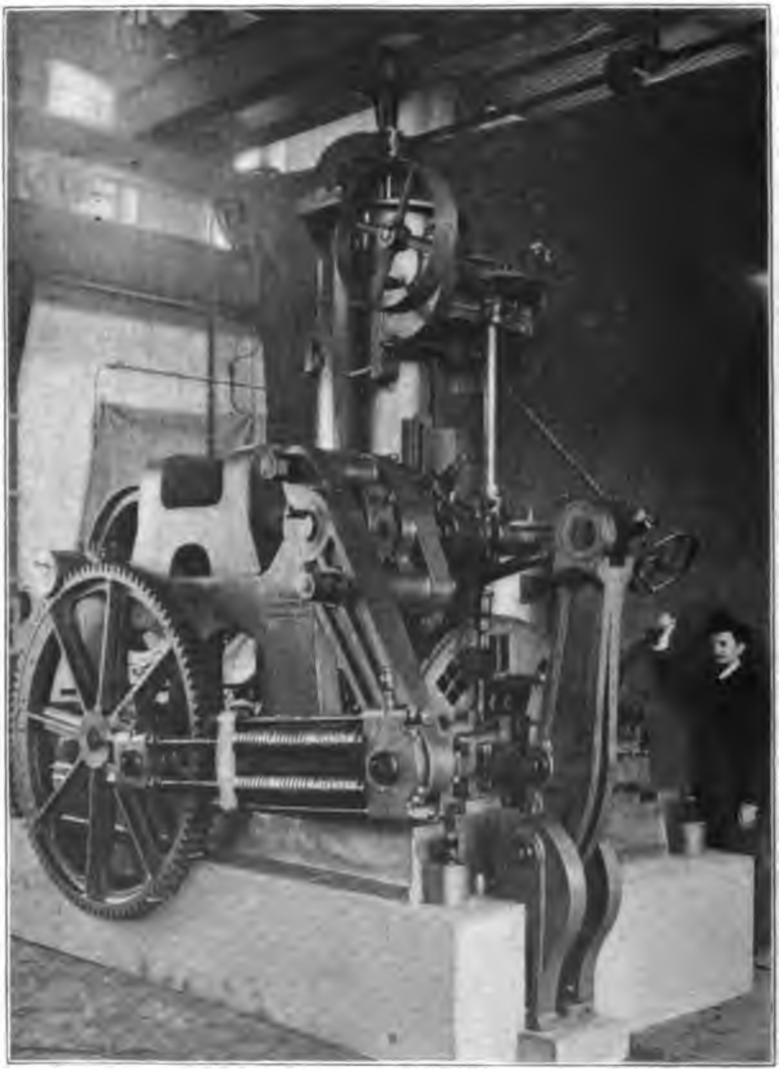
The output of soft-coal briquettes in western Germany is controlled by a syndicate called the Briquette Sale Syndicate of Dortmund, which includes among its members 31 factories, located in Westphalia and the Rhine provinces. These establishments employ, collectively, 112 machine presses of the Couffinhal type, besides 1 French machine of the Bourriez model and 3 so-called "egg rollers," or machines, which produce small, oval briquettes of egg size which are burned in certain kinds of tubular boilers. The syndicate claims a maximum annual capacity of 2,100,000 tons, and, as its official report shows, makes about three-fourths of that amount—whatever the market will take at prices which the syndicate managers consider equitable. Industrial briquettes are usually of a square or oblong form, convenient to be closely packed or built up into a wall, like bricks, whereby they greatly economize space as compared with raw coal. They range in weight from 3 to 10 pounds, and each bears the initials or trade-mark of the company by which it is produced, so that in case of any defect in quality the inferior briquette can be readily traced to its source of production. When burned whole, they are consumed slowly and give out a steady, moderate heat for a long time; when it is desired to quicken or intensify the flame, they are broken up, and in this condition are especially adapted to flue or tubular boilers, sugar evaporating, smelting, and annealing furnaces, in glass manufacture, or in porcelain and cement factories, wherever, in fact, a fuel capable of producing a long, fierce flame is desirable. Their efficiency as locomotive fuel may be inferred from the fact that the State railways of Prussia, which used 130,000 tons of such fuel in 1889, have bought from the syndicate 680,000 tons during the first nine months of 1902.

Anthracite coal is so sparingly produced in Germany that the use of hard-coal dust for briquette making is relatively unimportant. Experts, however, agree that with an admixture of from 4 to 8 per cent of matrix, the manufacture of anthracite briquettes, which will bear transportation by sea or land in any climate, presents no technical difficulty.

As has been indicated in previous reports, the manufacture of coke and briquettes from peat or turf is still relatively in the experimental stage, although there are several factories in successful operation and another—the largest of all—is just being put into operation at Königsberg, on the Baltic coast of East Prussia.

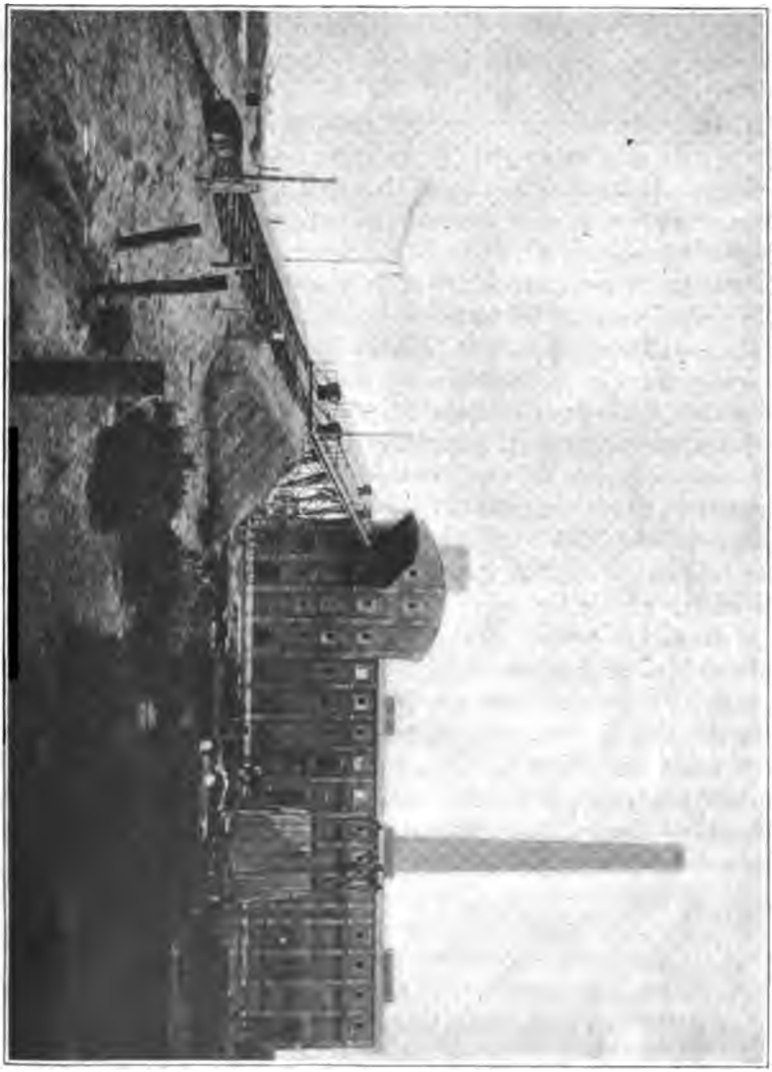
The fourth illustration (p. 91) shows the principal peat-briquette factory in this country. It is located near Stettin, has been in operation several years, and is apparently successful.

III. As a result of the present widespread interest in this subject and the many inquiries that have been received from mine owners and operators for technical information as to processes, cost, and capacity of machinery, etc., a combination has been formed between three of the foremost machine builders in this country, whose products collectively include all the necessary apparatus for making briquettes from coal dust, brown coal, and peat. The purpose of this syndicate is to meet promptly and efficiently the American demand for machinery and working methods, which represent the best results obtained by scientific study and mature experience in Germany. The combination is entitled "The Export Syndicate of Briquette Machinery Manufac-



Machine press for soft-coal briquettes (90 tons per day).

turers," with central office at No. 59 Friedrich strasse, Berlin, and includes as members the Zeitzer Eisengiesserei at Zeitz, Saxony, the Maschinenfabrik Buckau at Magdeburg, and the Maschinenfabrik (formerly Jaeger) at Ehrenfeld-Cologne. Its plan is to send over, within a few weeks, an experienced engineer, who will establish an office at New York and be prepared to confer with firms and persons who contemplate entering upon the manufacture of briquettes, to examine sites and materials, make plans and estimates for buildings, machinery, etc. An opportunity will be thus offered for American mine owners and operators to ascertain definitely in advance the theo-



The principal peat-briquette factory in Germany.

retic value of their materials for briquette making and the cost of a plant of a given daily capacity.

Meanwhile the same results can be reached with important saving of time if owners of coal mines or lignite beds will send to the above address, directly or through this consulate, 10-pound samples of their material in the exact condition in which it will be available in large quantities for practical use. The percentage of water in any briquette material is an important factor in determining how it can best be worked.

If the material is dry—as, for instance, slack from a well-drained bituminous coal mine—the sample may be sent in an ordinary box or package. If, on the other hand, the slack or culm is obtained wet from a washing process, or if the material is lignite or peat from a bog, the sample should be sent in a tight tin case, which will preserve the exact percentage of moisture which will be encountered when it is mined for use on an industrial scale.

The postal-package treaty between the United States and Germany provides for the transmission by post, reciprocally, of packages not exceeding 5 kilograms (about 11 pounds avoirdupois) in weight at a uniform rate of 12 cents per pound. Allowing for the weight of the necessary covering, this will enable interested persons in America to forward to Berlin samples of their material sufficient in quantity to be analyzed, submitted to various tests, and even made experimentally into briquettes, so that its adaptability to briquette manufacture, the percentage of binder required, the caloric value of the product, and methods and machinery best adapted to working it can be ascertained and reported on in advance by responsible experts, who are prepared to follow up their estimates by practical operations.

In this way the technical experience and scientific knowledge which have made the briquette industry successful and important in Germany will be made directly available by American operators who desire to begin at the point of economic efficiency that has been attained by the best practice in Europe.

FRANK H. MASON, *Consul-General.*

BERLIN, *November 20, 1902.*

LIGNITE, PEAT, AND COAL-DUST FUEL IN GERMANY.

Since the publication of the last report of this series (see ante[a]) on the methods of manufacturing fuel briquettes from coal dust, lignite, and peat in Germany, two experienced engineers—one from New York the other from Minnesota—have come to this country to make careful scientific studies of the subject for the purpose of assisting to transplant the industry, or such of it as may be adaptable to American conditions, to the United States. Both these experts have declared themselves astonished by the proportions of the fuel-briquette manufacture in Germany, the size and number of factories engaged, the amount of capital invested, the technical excellence of machinery employed, the permanent fireproof buildings, and the modernized methods of handling materials and product. One of them said:

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[a] The reports by Consul-General Mason were published in Advance Sheets of Consular Reports.

> Of all this, we have at home not the faintest conception. We read a consular report that there are in this country 286 brown-coal-briquette factories with 691 presses; that they work up annually 44,211,000 tons of lignite; and that the 21 coal dust-briquette factories of the Dortmund Syndicate alone turn out 2,100,000 tons of "industry briquettes" per annum, but such figures leave no definite impression. We haven't got beyond the stage where a more or less experimental machine press under a wooden shed is considered a briquette factory.

Meanwhile each American mail continues to bring inquiries from owners of lignite, peat, and coal properties in many States and Territories, all asking for further details concerning German processes, the cost, capacity, and productiveness of machinery, thermal values and market price of the various kinds of briquetted fuel, and other information which it is difficult to condense into ordinary correspondence. With a view of answering more fully these inquiries—which at present relate more especially to the utilization of lignite and peat deposits—the present supplementary report is submitted.

I. THE LIGNITE-BRIQUETTE MANUFACTURE.

It has been repeatedly stated that the outward cleanliness of Berlin and other German cities is principally due to the general consumption of brown-coal briquettes for household and steam fuel; further, that they are made from ordinary German lignite without the use of tar or other artificial binder; that they are compact to store, clean to handle, easy to kindle, burn with a clear, strong flame, are cheaper than good bituminous coal, and are made practically smokeless. Lignite varies in its value and adaptability for briquetting purposes according to its geologic age, hardness, and the percentage of water contained. A lignite with less than 30 per cent of water is very difficult to work by the usual processes, and it is for this reason that Austria-Hungary, which has an abundance of very old and hard brown coal that contains from 26 to 28 per cent of moisture, has practically no supply of briquettes from that source. German lignite, on the other hand, is of much more recent formation; it contains from 46 to 52 per cent of water, and is usually so soft that it can be cut with a spade. Many lignite beds in this country are filled with logs and pieces of wood, so well preserved in the matrix of partially carbonized material that they burn readily and form a cheap and abundant fuel for steam and other heating at the briquette factories. The part played by the water contained in lignite forms the key to the whole economic briquetting process. The crude brown coal is brought from the mine, crushed and pulverized, and then run through a large revolving tubular cylinder, heated by exhaust steam from the driving engine, and hung on an inclined plane so that the powdered material runs downward through the tubes by gravity, and is carried into the machine press that stamps it into briquettes. During this passage through the cylinder, it is dried and heated until there remains the right proportion of moisture, combined with the proper temperature to develop the latent bitumen in the lignite and make the powdered mass plastic and easy to mold under heavy pressure between heated iron jaws into a hard, clean briquette, with a glistening surface and sufficient firmness of structure to stand weather, transportation, and other contingencies. To do this perfectly and economically, the natural lignite should contain, as it comes from the mine, approximately enough water so that heating to the proper temperature for pressing will evaporate out just sufficient water to leave it at the proper degree of moisture. The ideal proportion is about 45 per cent of water, so that German lignite contains rather too much, while Austrian contains much too little, though this latter difficulty has lately been partially overcome by steaming. The important question to be now decided is how American lignite will fulfill these requirements.

During the past six weeks samples of lignite from near Bismarck, N. Dak., and from Troy, Ala., have been received at this consulate, turned over to the syndicate mentioned in the last report, and molded experimentally into briquettes with entire success. The Dakota lignite is old and hard, contains 38 per cent of water, but crushes and pulverizes easily and forms without binder briquettes of firm structure, which burn readily, are practically smokeless, and leave only 4 per cent of ash, while the best German brown-coal briquettes yield from 9 to 12 per cent of inorganic residue. The percentage of water contained is rather low, but by adapting the heating-drying process to that proportion of moisture, this obstacle, such as it is, can be easily met, and the reduced task of evaporation will be an economy in the general process.

The Alabama lignite, on the other hand, is an ideal material, and from the one sample submitted is conceded here to be even superior to the standard brown coals of Germany. It contains the direct percentage of moisture, crushes easily, and molds readily into firm, shining, black briquettes, so clean that, as one of the experts at Magdeburg said, "They might be used for paper weights."

The importance of these simple demonstrations will be inferred from the fact that, according to a recent State geological report, there are 55,000 square miles of lignite beds in the Dakotas and Montana, all near the surface of the ground, and ranging in thickness from 20 to 80 feet. The extent of the lignite deposits in the Gulf States is perhaps less exactly known, but they certainly cover a large area. There is also lignite in Missouri, Iowa, and several other Western States and Territories, and it is from all those hitherto practically neglected deposits that an inexhaustible future supply of smokeless domestic fuel will be derived. It will therefore be of interest to state concisely what constitutes a first-class, up-to-date lignite-briquette factory in Germany, where the industry has reached, after many years' experience, its highest development. A typical example is the factory at Lauchhammer, about 80 miles south of Berlin, on the direct line to Dresden. This establishment, which is of the latest and most approved construction, has eight presses, with the necessary pulverizing, heating, and drying plant, run by electric motors with current generated by steam evaporated with wood from the mines, the whole under handsome, substantial buildings of brick, stone, and iron, and cost, with tracks, switches, and full equipment for handling raw material and loading the briquettes into cars, $371,000, of which $178,500 was paid for machinery. Each press weighs 32 metric tons and stamps out 100 to 120 briquettes per minute, or 70 tons in a double-turn day's work of twenty hours. The heating and drying apparatus for each press weighs 18 tons. The power required for each press and dryer is 125 horsepower, and both the dryer and jaws of the press between which the briquettes are squeezed at enormous pressure are heated by exhaust steam from the Corliss engine in the power house, the whole supply for the eight machines being equivalent to about 150 horsepower.

Thus equipped, the plant at Lauchhammer turns out from 500 to 600 tons of briquettes per day, which sell on cars at the factory for from 7 to 9 marks ($1.66 to $2.14), according to season and market, with an average of 8 marks ($1.90) per 1,000 kilograms, or metric ton of 2,204 pounds. Profits depend on the usual varying conditions, location, management, demands, etc., but it is common to read in the Berlin papers official notices announcing dividends of brown-coal briquette companies ranging from 15 to 20 per cent of their capital. So enormously has the industry been developed in recent years that there is now an overproduction, and it is said that 100,000 carloads (1,000,000 tons) oı briquettes will be carried over to the fuel supply of next summer and autumn.

II.—THE UTILIZATION OF PEAT.

Peat as a material for fuel ranks next in natural order below lignite, in that it is of similar but much more recent geologic origin, contains more water, is but slightly carbonized, and has a correspondingly lower thermal value than brown coal. The task of converting peat into serviceable fuel consists in cleaning the material of roots and rubbish, reducing the water to a small percentage, and so condensing the peat in volume that its thermal value shall be raised to practical efficiency. This is done by various methods, some of which are in this country as yet partially covered by patents, but they may all be grouped under three heads, according to the form which the ultimate product is to assume, viz: (1) Compressed peat, with or without admixture of coal dust or other inflammable matter; (2) peat coke; and (3) briquettes made by compression, with or without heat, of the material prepared by the first of these processes.

COMPRESSED PEAT.

A pioneer in the invention of machinery and processes for making compressed peat in northern Europe appears to have been Mr. C. Schlickeysen, of Rixdorf, near Berlin, whose installation and present methods have been mentioned in a previous report of this series. His first two machines were of vertical construction, and were built in 1859 for a steam peat-compressing plant at Zintenhof, near Riga, in Russia, where they worked successfully for many years, turning out daily about 80,000 pieces of wet compressed peat, which, after drying, were used as smokeless fuel in a large cloth factory at that place. During the ensuing forty years he has built peat-compressing plants in Holland, Hungary, Switzerland, and at various places in Germany, constantly improving his equipment and processes with a view of perfecting the product, cheapening its cost, and substituting more and more automatic machinery for manual labor, until the system so evolved may be accepted as standard in this country.

Raw peat, as it comes from the bog, contains about 85 per cent water, 13 per cent combustible material, and 2 per cent inorganic matter. To obtain the 13 per cent of combustible elements in the cheapest, most direct manner, the peat is cut with spades and shoveled into the trough of a long, sloping belt-and-bucket elevator, which carries it up and drops it into a machine which cuts, tears, kneads, and mixes it to uniform consistency, in which state it passes downward and is forced out by a horizontal screw into long, plastic skeins about 3 by 4 inches in transverse section. These are delivered at the tail of the machine on boards 3 feet long, which are lifted off by hand when filled, laid on tram cars, and run out to a cleared space, where they are laid in rows on the ground and the skeins cut with a knife into bricks or sections 10 inches long, which, being left to dry, lose by exposure in ordinary weather one-half their water contents in a period of two weeks. The peat loses by this machine process one-third its bulk, so that a machine which works 21 cubic meters[a] of raw turf per hour delivers 14 cubic meters of clean peat or 7,000 wet bricks of the size indicated, which contain from 3 to 4 tons of dry compressed peat in a condition to be used as fuel. A plant of this kind includes, besides the elevator and grinding press, a 10-horsepower portable engine, which is fired with peat refuse, and cars and tracks for handling the material. The whole plant is movable, is taken bodily to the bog, set up at the farther edge of the moor to be worked, and moved backward as the peat bed is excavated and exhausted. An important recent improvement by Mr. Schlickeysen is an excavating machine, which in moors reasonably free from logs and stones digs and elevates peat with great rapidity, thus saving the hard, wet, unhealthy work of several men. The cost of such a plant, complete, with engine, tracks, cars, etc., ready to operate, is 18,620 marks ($4,431), and its operation, when used without machine digger, employs 17 men besides engineer and fireman, a total cost for labor in north Germany of 120 marks ($28.56) per day. After air-drying on the ground until their water contents are reduced to 38 or 40 per cent, the peat blocks are built up in open formation, like bricks in a kiln, to dry until the water is reduced to 15 to 18 per cent, when they become a fuel with a thermal value of 3,000 to 4,000 calories. This value may be increased by converting the air-dried peat into briquettes, which is done by heavy pressure with heat in a machine press specially constructed for the purpose.

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[a] 1 cubic meter = 35.316 cubic feet.

One of the important improvements of recent years has been attained by mixing the peat pulp, as it passes through the grinding machine, with other inflammable materials, viz, bituminous-coal dust or slack up to 30 per cent, anthracite culm to 40 per cent, or dry sawdust to 15 per cent. These dry, pulverized materials, when mingled with the wet peat, not only greatly enhance its subsequent value as fuel, but facilitate the drying process and render it tough, dense, elastic, and capable of being pressed cold into salon briquettes of high quality.

There are in the State of New Jersey, within easy distance of the coast, extensive peat beds which have not hitherto been utilized. There are at the terminal coal yards in Jersey City and Hoboken large quantities of coal dust, both anthracite and bituminous, that are treated as waste. May not the neglected peat and the worthless dust of the coal yards be combined by processes already perfected and successful here into a clean, cheap, and effective fuel for household purposes?

PEAT COKE AND SECONDARY PRODUCTS.

But by far the most modern, scientific, and rational method of utilizing peat appears to be that of converting it into coke, by carbonization in retort ovens with recovery of the gas, tar, and other by-products of distillation. This has been the subject of many years' study and experiment in Germany, the best results of which have been embodied in the system perfected and patented by Martin Ziegler, a chemical engineer of high reputation, which gives to the manufacture of peat coke the dignity of a perfected industrial process. Concisely stated, the Ziegler method consists in carbonizing peat in closed ovens, heated by burning under them the gases generated by the coking process itself. Such a plant is therefore self-sustaining, the only fuel required being coal or wood sufficient to heat the oven for the first charge, when the gases generated by the coking process become available and enable the operation to be repeated and continued indefinitely. Not only this, but the offheat from the retort furnaces passes on and heats the drying chambers in which the raw, wet peat is prepared for the ovens by drying to the point of economical carbonization. There is transmitted to the Department as an exhibit with this report a sample[a] of 1 kilogram (1,000 grams, or 2.2 pounds) of raw peat and the several products derived therefrom by the Ziegler process, each in its due proportion, as follows: Three hundred and fifty grams of coke, 40 grams of tar, and 400 grams of gas liquor, from which last is derived 6 grams of methyl alcohol, 6 grams of acetate of lime, and 4 grams of sulphate of ammonia. If this sample be multiplied a thousandfold to a metric ton, and the value of each product given at its present market price in Germany, the demonstration would be as follows:

Description.	Value.	
1 ton (1,000 kilograms) of peat, costing, dried, 5 marks ($1.19), produces—	*Marks.*	
350 kilograms (771.6 pounds) of peat coke	15.75	$3.75
40 kilograms (88.2 pounds) of tar	2.20	.52
6 kilograms (13.2 pounds) of methyl alcohol	4.20	1.00
6 kilograms (13.2 pounds) of acetate of lime	.72	.17
4 kilograms (8.8 pounds) of sulphate of ammonia	.88	.21
Total	23.75	5.65

The peat coke produced as the primary product of this process is jet black, resonant, firm, and columnal in structure, pure as charcoal from phosphorus or sulphur, and, having a thermal value of from 6,776 to 7,042 calories, it is so highly prized as a fuel for smelting foundry iron, copper refining, and other metallurgical purposes that it readily commands from 40 to 50 marks ($9.52 to $11.90) per ton. It is also a high-class fuel for smelting iron-ores, but as the process is comparatively new and the output limited, it is yet too scarce and expensive for blast-furnace purposes. Crushed and graded to chestnut size, it forms an excellent substitute for anthracite in base-burning stoves. In larger lumps, as it comes from the oven, it fulfills substantially all the various uses of wood charcoal as a clean, smokeless fuel. The cost of a 4-oven plant, with all apparatus for cutting and drying the peat, distilling the gas liquor, and extracting paraffin from the tar, is given at $95,200. Such a plant is reckoned capable of working up annually 15,000 tons of peat, the various products of which would sell, at present wholesale market prices, for 494,100 marks ($117,596). A plant of 12 ovens, with all appurtenances complete, would cost $261,800 in Germany, and should produce annually products worth $350,000, from which, deducting the carefully estimated cost of peat, labor, depreciation of property, and other expenses—$179,200—there would remain a profit on the year's operation of $170,800. This process is in successful operation at Redkino, in Russia, and the German Government has evinced its practical interest in the subject by placing at the disposal of the company a large tract of peat-moor lands, the property of the State, on which extensive works will be erected during the coming year.

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[a] Filed in the Bureau of Foreign Commerce, where it may be examined by parties interested.

III.—COAL-DUST BRIQUETTES.

While Germany is preeminent in the scientific utilization of lignite and peat as materials for prepared fuel, it is not apparent that this technical superiority is so absolute in the treatment of coal dust. It is true that the coal-briquette manufacture is fully organized and developed in this country, that there are several German builders of coal-briquetting machinery who are masters of that branch of construction; but the same is true of France, Belgium, and England, where the conversion of coal waste into briquettes for locomotive and other steam fuel, as well as for grates and heating stoves, has long been a standard and established industry. It is not known that it has anywhere been found possible to make a marketable briquette of bituminous or anthracite coal dust without the use of a matrix or binder to hold the pulverized material together. The percentage of binder required varies with the composition of the coal, from 2 to 10 per cent, and, as has been previously explained, the pitch of coal tar, which is the binder ordinarily used, costs in Germany from $10 to $12 per ton, and at that price its use for briquetting purposes in a higher proportion than 6 to 7 per cent is commercially unprofitable.

The ingenuity of inventors in European countries has of late years been directed especially toward improvements in binders and the discovery of materials other than coal tar which would answer the same purpose. One hears and reads from time to time of a new matrix which will cheapen the cost of coal briquettes, facilitate their manufacture, or improve their quality; but these accounts are founded rather on the claims of inventors and promoters than on demonstrated industrial results. One of the latest and most interesting of these discoveries is reported from England, where it is stated that Messrs. William Johnson & Sons, makers of briquette machinery at Leeds, have in use a binder produced by an inventor named Cory, which, when used with Cardiff coal, produces industrial briquettes which are practically smokeless. This fuel is under trial by the British Admiralty, and a photograph has been published showing two war vessels steaming side by side—one burning raw Cardiff coal, with volumes of dense smoke trailing from its chimneys, the other using Cardiff briquettes made by the Cory process, leaving an aerial wake as clear as though the furnaces were stoked with charcoal or anthracite. So far as appears, this process does not claim to use the inferior waste of mines or coal yards, but takes good coal, condenses and renders it compact to transport and, to all practical purposes, smokeless. It is further stated that a machine costing $4,500 will produce 50 tons of briquettes per day, and plans are matured by which one or more of them will be exhibited in operation during the coming exposition at St. Louis.

FRANK H. MASON,
Consul-General.

BERLIN, *March 19, 1903.*

AIX LA CHAPELLE.

There are a number of small briquette factories in the vicinity of Aix la Chapelle, but no pertinent statistics are available. The majority of them are situated at or near the mines, the surplus and waste coal and coal dust from which are utilized. As nearly as I can ascertain, the briquettes are composed, in weight, of 6 parts coal waste or fine coal of a bituminous character, 1 part of good gas or cannel coal, and 1 part of a mixture known as asphalt earth, brai, or tar pitch.

I am unable to ascertain reliably the cost of manufacture, but fine or waste coal costs approximately $1.25 a ton; gas or cannel coal, $2.50, and the asphalt earth, brai, or tar pitch, $10.

The wholesale price for briquettes runs from $4 to $6 a ton.

The Humboldt Actien Gesellschaft, near Cologne; the Couffinhal (an English system), Schüchtermann & Kremer, of Dortmund, and the Zeiter Machinen Fabrik, Germany, all have patented systems and manufacture and erect plants for making briquettes.

The usual method of production is as follows: Three thousand eight hundred pounds of coal waste, 600 pounds of gas coal, and 400 pounds of asphalt earth, brai, or tar pitch are dumped into a cemented vat, whence, after having been partly mixed, they are transferred by means of a chain bucket carrier to a crushing or mixing mill. From this mill the mass is again moved to another vat, where by means of a wheel with perforated paddles it is thoroughly mixed with superheated steam. From the second vat it goes to the molding machine.

The briquettes are made in various weights, from 2 to 10 pounds, and are subjected to heavy pressure. About 15 men and boys are employed at the plant visited by me, the daily output of which, I am informed, is 90 tons.

Briquettes made of good raw material develop about the same heat as does coal. Many thousands of tons of these briquettes may be seen piled in railway yards, for utilization in case of shortage in the coal supply. They are especially desirable in instances where a quick, clean fire is essential. The cost of briquettes to the consumer exceeds that of coal. Of the total German production of this fuel, the railroads utilize about 50 per cent, private houses 8 per cent, factories 32 per cent, and steamships the remainder. The number of tons of briquettes made in Germany in 1901 was 1,566,385.

There are some lignite deposits in the neighborhood of Aix la Chaelle, but in every instance attempts to develop them have failed. There is also considerable peat or turf on the Eifel Mountains, quantities of which are used locally. A large brick plant made an attempt about a year ago to utilize this fuel, but not meeting with success abandoned the venture.

Persons that contemplate engaging in the manufacture of briquettes would do well to apply to Ferdinand Schmetz, Herzogenrath, Germany, a chemist who has given considerable attention to the matter of reducing tar and pitch without damaging their heating, burning, and keeping qualities, and to the exact percentage of mixtures to use in the manufacture of both anthracite and bituminous briquettes.

So far as I can ascertain the briquettes to be successful must be able to withstand the extremes of both heat and cold without deteriorating, and during combustion will neither melt into a mass nor leave a residue.

FRANK M. BRUNDAGE, *Consul.*

AIX LA CHAPELLE, *December 8, 1902.*

BARMEN.

Briquettes are made of different kinds of coal, crushed, sifted, ground to powder, and mixed with coal pitch to facilitate combustion. The following are the three sizes in which the briquettes are manufactured: 220 by 110 by 105 millimeters (8.6 by 4.3 by 4.1 inches), weighing about 3 kilograms (6.6 pounds); 280 by 150 by 110 millimeters (11 by 5.9 by 4.3 inches), weighing about 5 kilograms (11 pounds); 160 by 160 by 105 millimeters (6.3 by 6.3 by 4.1 inches), weighing about 3 kilograms (6.6 pounds). Egg-shaped briquettes of from 35 to 125 grams (1.2 to 4.4 ounces) in weight are also produced.

Compared with the cost of coal, it is said that briquetted fuel represents an economy of from 10 to 15 per cent, and that its residuum amounts to only 6 to 8 per cent.

In the introduction of briquettes for railroad uses, many difficulties had first to be overcome. For instance, engineers objected strongly to the dust caused by the breaking of the new fuel. In the course of time, however, they learned how to handle the briquettes properly, and now the railroad companies are making use of the latter in large quantities.

The following firms are manufacturers of briquetting machinery, and are ready to furnish on application illustrated catalogues and price lists:

Schüchtermann & Bremer, Dortmund, i. W.
W. Dunkelberg, Bommern, o. Ruhr.
Maschinenbau Actien-Gesellschaft Tigler, Meiderich, n. Ruhsort.
Maschinenfabrik Baum, Herne, i. W.
Petry & Hecking, Dortmund, i. W.
Zeitzer Eisengiesserei und Maschinenfabrik, Actien-Gesellschaft Filiale, Cologne-Ehrenfeld.
Maschinenfabrik Buckan Actien-Gesellschaft, Magdeburg.

Briquettes may be exposed to the open air for several years without loss of quality or weight, the pitch used in their manufacture effectively protecting them from dampness.

It takes 20 per cent less room to store briquettes than coal. Spontaneous combustion of briquettes is impossible, and they will not lose their original shape even though subjected to the extreme heat of the Tropics.

They are especially suited for the use of railroads, steamers, iron works, furnaces, sugar refineries, glass works, porcelain and cement works, dredging machines, and for the household.

The possible output of braunkohlen (soft coal) briquettes (both lignite and peat) in Germany is 10,000,000 tons. The actual production during the present year, however, is estimated to be from 8,500,000 to 9,000,000 tons, of which about 2,500,000 tons are made in the provinces of Rhenish Prussia and Westphalia.

The maximum capacity of the works engaged in the manufacture of Steinkohlen (hard coal) briquettes is said to be about 2,000,000 tons.

The quoted prices per 10,000 kilos (22,046 pounds) are: For soft-coal briquettes, 92 to 100 marks ($21.89 to $23.80); for hard-coal briquettes, 150 marks ($35.70); for egg-shape, hard-coal briquettes, 170 marks ($4.04).

MAX BOUCHSEIN, *Consul.*

BARMEN, *December 4, 1902.*

BREMEN.

There is but little demand for briquetted fuel here, Bremen not only being near the Rhenisch-Westphalian coal fields, but also offering easy access to English coal.

There is no briquette factory in this consular district. I am informed, however, that the briquette trust, which has its headquarters at Dortmund, controls 31 plants, all situated in the province of Westphalia. In these factories, are in use 122 presses of the system Conffinhal, 1 press of the system Bourriez, and 3 egg-briquette presses, the total annual capacity of which is 2,100,000 tons.

Anthracite siftings under six-tenths of an inch in diameter and all kinds of bituminous coal are utilized as raw material; but as the crushed coal has no cohesive qualities a binding material is required, and for this purpose coal pitch thoroughly comminuted is employed.

As a rule, the briquettes are manufactured in two forms, viz:

(1*a*) Long form, weighing 6.6 pounds, measuring 8.6 by 4.3 by 4.1 inches; (1*b*) long form, weighing 11 pounds, measuring 11 by 9.9 by 4.3 inches; (2) square form, weighing 6.6 pounds, measuring 6.3 by 6.3 by 4.1 inches.

Egg-shaped briquettes are also manufactured. They vary in weight from 1¼ to 4½ ounces. These, however, are not sorted into different grades.

The coal pitch contained in the briquettes ignites quicker than coal and throws off heat more readily; hence it is claimed that steam is produced more rapidly by their use. It is also claimed that they give less smoke.

The experiments made at the imperial navy-yard at Wilhelmshaven show that 1 pound of the best quality of briquettes will vaporize more than 9 pounds of water at 0° C.

It requires a pressure of about 200 atmospheres to form briquettes. Consequently they are very compact and are therefore not easily chipped off or broken. In burning, they leave only 6 to 8 per cent ashes.

Although coal briquettes are not at all popular in Bremen, a great deal of peat is used for fuel. This peat is found in abundance in the numerous bogs on this northern coast of Germany, and I am told by people who use it that it is not only a good substitute for coal, but in some respects is better; it keeps fire longer and costs less.

At Varel, near Bremen, there is a flourishing plant manufacturing peat briquettes, or "Maschinentorf," as they are called, that are spoken of very favorably. This enterprise is operated as follows:

Where the peat strata are thin, the peat is dug with shovels, but where they extend to some depth and there are no obstructions, it is removed by machinery.

The raw peat is comminuted and then put through a shaking and sifting process until all the loose fiber and roots are eliminated and the peat is reduced to a pulp. It is claimed that after the extraction of all the fibrous substances, the peat dries more rapidly, and that a greater compactness or density is attained in the final product.

This pulpy or pappy mass, after being dried, is cut into pieces about 5.5 by 12 by 4 inches, which are again put out to dry, their position being changed frequently, a process which in good weather takes some fourteen days. When these pieces become thoroughly dry, their dimensions have generally shrunk to about 2.7 by 8 by 2.7 inches.

The cost of production, allowing nothing for the fuel used, is about $1 per metric ton, whereas the selling price ranges from $1.55 to $1.65 per ton f. o. b.

The capacity of the plant at Varel, which has six machines and employs a force of 130 hands, is from 200,000 to 250,000 peat briquettes per day, with an approximate weight of 250 tons.

HENRY W. DIEDERICH, *Consul.*

BREMEN, *January 31, 1903.*

BRESLAU.

The amount of briquetted fuel manufactured yearly naturally varies considerably, according to the demand, but a daily production of about 3,500 carloads of about 10 metric tons (22,046 pounds) each and an annual production of some 1,050,000 carloads, or 10,500,000 metric tons, may be taken as approximate amounts.

Briquettes are manufactured from soft bituminous coal and lignite, as well as from a heavy, black "fat peat," without any binding material, and also from a hard bituminous coal, to which pitch is added as a binding medium.

The cost of production is said to be from 35 to 45 marks ($8.33 to $10.71) per 10 metric tons, exclusive of the wear and tear on the plant.

They are sold at 70 to 75 pfennigs ($0.1666 to $0.1785) per centner (110.23 pounds) by the wagonload delivered at the railway, or 90 to 100 pfennigs ($0.2142 to $0.238) per centner (110.23 pounds) at retail delivered at the house.

Briquettes are made from lignite by a process of sifting, grinding, and mixing with water and of drying to a certain consistency, when the mass is again ground and finally pressed, without the addition of any binding material. Turf briquettes are also manufactured in the same way.

The daily production of a briquette plant depends, of course, upon the material to be pressed and the number of presses contained in the plant, which may be from one to twelve. The average in Silesia is about three presses to the plant. Five to six carloads of briquettes may be taken as the average daily production of one press worked day and night.

The plants in this section are located as follows:

Dr. Casimir Dziegiecki, 71 Siebenufenerstrasse, Breslau; Erhardt und Hueppe, 11 Bahnhofstrasse, Breslau.

Gewerkschaft "Cons. Moltke," Crone a Brahe (Posen).

Gewerkschaft "Concordia," Görlitz (2 presses).

"Glueckauf" Actien-Gesellschaft für Braunkohlenverwertung, Lichtenau o.L. (3 presses).

"Saxonia" Braunkohlenwerk und Briquettefabrik Actien-Gesellschaft, Zeisholz bei Bernsdorf (3 presses).

Gewerschaft konsol. Gruenberger Gruben, Gruenberg, Silesia.

The following firms manufacture briquette machinery:

Maschinenfabrik Buckau, Actien-Gesellschaft, Buckau-Magdeburg.
Schuechtermann & Kraemer, Dortmund.
Rudolf Leder, Quedlinburg.
Zeitzer Eisengiesserei, Zeitz, Saxony.

Ernest A. Man, *Consul.*

Breslau, *February 14, 1903.*

DRESDEN.

In the month of September, 1902, the total output of briquetted fuel in the Kingdom of Saxony amounted to 23,651 tons.

The latest official statistical report on the subject is for 1895. It states that the number of briquettes turned out during that year was 165,000,000; but since that time the industry has made rapid strides.

The materials used in the manufacture of briquettes are washed hard coal (Steinkohle), yielding 5,000 to 6,500 calories of heat; anthracite dust, 6,500 to 8,000 calories; sieved and dried brown coal, 2,000 to 3,250 calories. Small amounts of peat are also utilized.

The selling prices of briquettes at the place of manufacture are:

Hard-coal briquettes	per 10 tons (22,000 pounds)..	$30 to $40
Anthracite-dust briquettes	do...	50 to 75
Soft-coal briquettes	do...	15 to 25

The cost of production naturally varies according to conditions, such as wages, cost of raw materials, degree of humidity of the product, and accessibility to railroads and consuming centers.

The above-stated selling prices net an interest of from 8 to 40 per cent on money invested.

The principal manufacturers of briquette machinery are:

Zeitzer Maschinenfabrik, Zeitz.
Koenigin Marienhuette, Cainsdorf, near Zwickau, Saxony.
Bernburger Maschinen Fabrik, Bernburg.
Hallesche Maschinen Fabrik, Halle a. S.

The peat and lignite is dried by the hot-air process, and as a binding material, pitch (American and Russian), asphaltum, and colophony are used.

The cost of erecting a small plant runs from $10,000 to $25,000. One press produces from 40 to 120 tons per day. Riebecksche

Montanwerke, at Halle a. S., has from 38 to 40 presses steadily at work.

The heating value of hard-coal briquettes is 6,000 to 8,000 calories, and of soft-coal briquettes, 4,500 to 5,500.

ALFRED C. JOHNSON,
Vice and Acting Consul-General.

DRESDEN, *December 20, 1902.*

FRANKFORT.

Fuel briquettes are not produced in this consular district, but I have ascertained the following facts on the subject:

The Prussian Government annually purchases for its railroads more than 500,000 tons of fuel briquettes.

German briquettes vary in weight and shape; for steam boilers they are 8 by 4 by 3½ inches and weigh 6⅝ pounds. A larger size—11 by 6 by 4 inches and weighing 11 pounds—is also used.

The "Egg" briquettes weigh from 1¼ to 4½ ounces.

The binding material consists almost exclusively of hard pitch—a product of coal tar. Oxygenous material, such as manganese, is added in order to obtain smokeless combustion.

The briquette presses work with a pressure of 200 atmospheres.

According to tests made at the imperial navy-yard at Kiel, 1 kilogram of best briquettes, at a heat of 0° C., converted over 9 kilograms, of water into steam.

RICHARD GUENTHER,
Consul-General.

FRANKFORT, *November 21, 1902.*

MAGDEBURG.

In the consular district of Magdeburg, there are at present 10 briquette factories, 7 in the neighborhood of Magdeburg and 3 in the Halberstadt region. These factories have altogether 39 presses, each press producing daily about 50,000 kilos (110,230 pounds).

It is impossible to ascertain the exact amount of briquettes used in this district, but it can be stated that in the Altmark, the northern part of the district, 50 per cent of briquettes is used to 50 per cent of "brown coal" or lignite. In the settlements on the Elbe, however, owing to the cheapness of transportation, 90 per cent of Bohemian lignite is used to 10 per cent of briquettes, while in the region of the Harz Mountains 80 per cent of briquettes is used to 20 per cent of lignite.

In addition, there is an insignificant amount of briquettes of common coal used in iron foundries and sugar refineries.

The cost of manufacture per ton, depending upon the material and the percentage of water it contains, is approximately as follows:

Description.	German currency.	United States currency.
From lignite taken from the open working under good conditions, with water contents of about 46 per cent:	*Marks.*	
In large briquette factories	4.8- 5.4	$1.14-$1.29
In small briquette factories	5.0- 5.8	1.19- 1.38
From lignite taken from the open working, with water contents of more than 46 per cent, in large briquette factories	5.8- 6.8	1.38- 1.62
From lignite taken from the deep working, with water contents up to 46 per cent:		
In large briquette factories	5.5- 6.8	1.31- 1.62
In small briquette factories	6.8- 7.3	1.62- 1.74
From lignite taken from the deep working, with water contents of more than 46 per cent, in large briquette factories	7.0- 7.8	1.66- 1.86
From heavy air-dried peat, with 30 to 40 per cent water, reckoning the peat at 2.8 to 3 marks (66 to 71 cents) a ton:		
In briquette factories with 1 press	7.8- 8.2	1.66- 1.95
In briquette factories with 2 presses	7.0- 7.8	1.66- 1.86
From a lighter air-dried peat, with 30 to 40 per cent water, reckoning the peat at 3 marks (71 cents) a ton	9.0-10.0	2.14- 2.38
From sawdust of soft wood, with 30 to 35 per cent water, reckoning 1 ton of this material at 2 marks (47 cents) in briquette factories with 1 press	6.8- 7.2	1.62- 1.71
From sawdust of hard wood, with 30 to 35 per cent water, reckoning 1 ton of this material at 2 marks (47 cents) in briquette factories with 1 press	6.2- 6.8	1.48- 1.62

In the case of materials containing from 15 to 18 per cent water, for which a drying process is not necessary, the cost of manufacture is naturally considerably lower.

In the factories in this district, however, lignite alone is used in the manufacture of briquettes.

The selling price, depending upon the quality of the briquettes, upon the region where the sale takes place, and upon the season of the year, is between 8.5 and 24 marks ($2.02 and $5.71) a ton. The price of lignite briquettes in this district is usually 7.5 to 11 marks ($1.79 to $2.62) a ton for parlor briquettes and 7 to 9 marks ($1.66 to $2.14) for industrial briquettes.

Complete outfits of machinery for briquette factories are supplied by—

The Fuerstlich Stalberg'sche Maschinenfabrik, Magdeburg.
The Bernburger Maschinenfabrik, Bernburg.
Zeitzer Eisengiesserei und Maschinenfabrik Actein-Gesellschaft, Zeitz.
Roehrig und Koenig, Magdeburg.
Buckauer Maschinenfabrik, Magdeburg.

All of these firms are prepared to furnish information and submit estimates to interested parties free of charge.

Some of the presses and apparatus for drying are partially patented, but the systems in general are not patented.

The Bernburger Maschinenfabrik, above mentioned, manufactures drying apparatus according to the system Schulz.

As of possible interest in this connection, I may mention that a patent has recently been applied for in the United States, as well as in Germany and Austria, by Mr. Schwarz, of this consular district, for the manufacture of briquettes[a] out of poor and otherwise useless coal with the aid of a very cheap, in fact almost worthless, binder. It, is claimed that briquettes made according to this system emit no unpleasant odor while burning; they give out a great deal of heat; the binder is not destroyed either by water or high temperature, and the process of manufacture is extraordinarily simple.

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[a] Sample of which has been filed for reference in Bureau of Foreign Commerce.

Director Max Salzmann, of the Buckauer Maschinenfabrik, has also recently applied for a patent in the United States for improvements in briquette presses.

WM. A. MCKELLIP, *Consul.*

MAGDEBURG, *January 27, 1903.*

MAINZ.

Briquetted fuel has long been used in Germany, with results eminently satisfactory, both on account of its lower price and its greater heating value as compared with the coal from which the briquettes are made. The heating value of the latter is from 10 to 15 per cent greater than that of the coal, while their wholesale price f. o. b. only ranges from but 11 to 12 marks per metric ton of 1,000 kilos ($2.62 to $2.86 per 2,200 pounds). The wholesale price at Mainz, exclusive of octroi duty, is from 15.50 to 16 marks ($3.69 to $3.81) per metric ton, while the retail selling prices, delivered at the house in this city, including octroi duty, runs from 23 to 25 marks ($5.47 to $5.95) per metric ton.

The cost of production, which it was impossible for me to ascertain, depends largely upon the cost of coal pitch, which is used as a binding material. The price of the pitch has steadily increased during the past few years, and is to-day quoted at 80 marks ($19.04) per metric ton.

Briquetted fuel is manufactured from bituminous coal (anthracite can be used only in combination with bituminous coal, as the former does not ignite readily), lignite, and peat. The last two materials are, however, little used, and, owing to their inferior value, only in the immediate neighborhood of their production. Lignite is mined in a similar manner to ordinary coal, while peat is dug from peat bogs. Both products are dried by exposing them to the air.

The coal best adapted for the manufacture of briquetted fuel is of a semibituminous character, very similar in quality to Nixon's steam navigation coal, and burns with a long flame and an exceedingly small amount of smoke and soot. Only coal dust and the finer grains of coal, under one-half inch in diameter, are used. Both are carefully cleaned from all impurities and then ground fine. As a binding material coal pitch, produced from coal tar, has proved most satisfactory. The briquettes are pressed into the required shape by machinery under a pressure of 200 atmospheres.

Briquetted fuel is usually made in the following shapes and sizes:

1. In oblong bricks, 220 by 110 by 105 millimeters (about 8⅔ by 4⅓ by 4 inches), each weighing about 3 kilos (6.6 pounds).

2. In oblong bricks, 280 by 150 by 110 millimeters (about 11 by 6 by 4⅓ inches), each weighing about 5 kilos (11 pounds).

3. In square bricks, 160 by 160 by 105 millimeters (about 6⅓ by 6⅓ by 4 inches), each weighing about 3 kilos (6.6 pounds).

4. In two sizes of egg-shaped bricks weighing, respectively, about 35 and 125 grams (1¼ and 4½ ounces).

Owing to the presence of coal pitch in briquetted fuel, the latter is more readily ignited. It also develops steam more rapidly than ordinary coal.

According to experiments carried out at the Imperial dockyards at Wilhelmshaven, 1 kilo (2.2 pounds) of good quality of briquettes converted 9 kilos (19.8 pounds) of water at 0 degree centigrade (+32 degrees Fahrenheit) into steam.

The incombustible residuum is, according to the quality of the briquetted fuel, from 6 to 10 per cent less than from coal, and the slag is readily removed.

The introduction of coal briquettes for railroad purposes at first met with serious opposition on part of the engineers and firemen, owing to the dust caused by breaking up the fuel, but now that their manufacture has been vastly improved, briquettes are used largely on all railway lines.

Briquetted fuel may be stored in the open air for many years without deteriorating in quality, the coal pitch protecting it from dampness. Spontaneous combustion is impossible. Coal briquettes, when properly stored, require 20 per cent less room than the same weight of coal.

They are not affected by tropical heat and are well adapted for use on railroads and steamships, in ironworks, sugar factories, glass works, furnaces, porcelain and cement works, and for domestic and many other purposes.

The following figures show the production and home consumption of briquetted fuel in Germany during the year 1900:

Description.	Production.	Home consumption.
Bituminous briquetted fuel.		
	Long tons.	*Long tons.*
Rhineland and Westphalia	1,546,816	1,426,416
Saxony	8,500	8,500
Aix-la-Chapelle region, about	15,000	15,000
Middle and Upper Rhine	400,000	400,000
Total	1,970,316	1,849,916
Lignite briquetted fuel.		
Cologne region	930,000	783,910
Saxony	95,000	95,000
Total	1,025,000	878,910

Of the total production—2,995,316 tons, of 2,200 pounds—2,728,826 tons were consumed at home and the remainder either exported or used by steamships.

The "Maschinenbauanstalt Humboldt," in Kalk, near Cologne, manufactures briquette presses, while the bituminous briquetted fuel itself is produced as a by-product by the following mining companies:

Zeche Altendorf, Dahlhausen a. d. Ruhr.
Aplerbecker Actien-Verein für Bergbau.
Zeche Baaker Mulde, Linden a. d. Ruhr.
Zeche ver. Birkefeld Tiefbau, Aplerbeck.
Zeche Blankenburg, Hammerthal a. d. Ruhr.
Zeche Bommerbaenke Tiefbau, Bommern.
Zeche Caroline, Holzwickede.
Zeche ver. Dahlhauser, Tiefbau, Dahlhausen a. d. Ruhr.
Zeche Actien-Gesellschaft, Zeche Dannenbaum, Bochum.
Zeche Eiberg, Steele.
Zeche Eintracht, Tiefbau, Steele.
Zeche ver. Engelsburg, Bochum.
Zeche Freie Vogel und Unverhofft, Hoerde.
Zeche Fröhliche Morgensonne, Wattenscheid.
Zeche Gottessegen, Loettringhausen.
Zeche Hamburg und Franziska, Witten.
Zeche Harpner Bergbau-Actien-Gesellschaft, Dortmund.
Zeche Herkules, Essen.
Zeche Johann Deimelsberg, Steele.
Zeche Julius Philipp, Bochum.
Muehlheimer Bergwerks-Verein, Muehlheim a. d. Ruhr.
Zeche Lothringen, Gerthe, near Bochum.
Zeche ver. Poertingsiepen, Kupferdreh.
Gewerkschaft ver. Rosenblumendelle, Muehlheim.
Zeche Schuerbank und Charlottenburg, Aplerbeck.
Zeche Siebenplaneten.
Zeche Steingott, Kupferdreh.
Zeche Victoria, Kupferdreh.
Zeche ver. Wiendahlsbank, Annen.
Zeche Alte Haase, Sprockhoevel.
Zeche Hoffnungsthal, Sprockhoevel.

All of the above companies, except the last two, form a trust and effect their sales through a joint sales agency at Dortmund, known as "Bricket-Verkaufs-Verein zu Dortmund."

The most important lignite briquette manufacturers are located in the neighborhood of Liblar, near Cologne, and effect their sales through a joint sales agency at the latter city, known as "Briketts-Verkaufs-Verein Coeln."

The lignite mining company "Friedrich," at Hungen (Ober-Hesse), also manufacture lignite briquettes.

WALTER SCHUMANN, *Consul*

MAINZ, *November 28, 1902.*

MANNHEIM.

The manufacture and use of briquettes for fuel in this part of Germany extends over a period of from twelve to fifteen years and is rapidly increasing. It is stated that during 1902, their production was almost 100 per cent greater than in any previous year. About 500,000 metric tons (of 2,204 pounds) of briquettes were made last year by the several local factories, the four largest of which have a total combined capacity of about 1,700 tons a day. The best equipped and most important of these factories has a capacity of 500 tons per day of eleven working hours. This plant is admirably located on two Rhine harbors of this city and is operated in connection with the largest local wholesale coal yard. This concern has an extensive power plant and excellent facilities for unloading coal from river barges and for storing and handling it. Its briquette plant may be taken as embodying the latest methods for the manufacture and handling of fuel briquettes in this locality. To the courtesy of its managing director I am indebted for a visit to the plant and for most of the facts herein given.

METHODS OF MANUFACTURE.

The process of manufacture is not complicated and consists essentially in thoroughly mixing fine coal with coal-tar pitch under temperature sufficient to melt the pitch, and in pressing the heated mass into briquettes of the form desired. The coal used, which forms from 90 to 92 per cent of the briquettes, is mainly fine soft or bituminous. To some extent, anthracite is used with soft coal, and this combination produces a briquette of superior quality. This fine coal is not coal dust merely, but is the very fine coal residuum from the several processes of sifting to which coal is subjected in Germany. Only such coal is used for briquettes as will pass through a 10-millimeter screen. This coal is known to the trade as "Gries." In the process of mining and handling the grades of soft coal sold in this market it is stated that from 35 to 40 per cent of gries is produced. My informant states that the demand for this product for briquette manufacture is so large that the price at the mines has risen greatly during the past few years, being at times from one-half to two-thirds the price of screen coal.

The binding ingredient in the briquettes manufactured in this district is the ordinary coal-tar pitch of commerce, the residuum of coal tar after the valuable oils have been removed by distillation. At this season of the year, February, it is hard and must be handled with pick and shovel. It is ground in a mill of simple construction, and is carried by a system of elevators to a point where it is met by a corresponding stream of fine coal. The mass is then passed into a receptacle where steam at high temperature is admitted and the coal and pitch are thoroughly mixed, the heat from the steam melting the pitch and at the same time removing any water that may be in the coal. This receptacle is referred to as a drying apparatus, though it is a mixing apparatus as well. Different forms of dryer are used, the most common kind consisting of a large hollow cylinder or drum revolved by means of gearing and fitted with a series of narrow shelves running lengthwise on the inner surface of the cylinder, for facilitating the process of mixing as the cylinder turns. As one end of the cylinder is higher than the other, the contents tend to work from the end where they are admitted to the point of egress at the other end. The largest dryer in use at the factory visited is nearly 50 feet long and about 6 feet in diameter.

After the process of drying and mixing has continued for a few minutes the hot mass, now called "Brei," passes to the powerful presses, where it is rapidly pressed into the form of briquettes.

These presses are of different pattern. All are heavy machines operated by steam, and each has a capacity of from 10 to 15 tons an hour. From the presses the briquettes are carried by elevators to the cars, where they are loaded. From the time the coal and pitch enter the building until they are in the form of finished briquettes is about ten minutes. Each process is performed by machinery.

No claim is made that the methods used in this factory are patented or secret, though a part of the machinery is protected by patents. Two forms of presses are recognized. They are known as the system Coufinall of Messrs. Schüchtermann und Krämer, Dortmund, Westfalia, and the system Tigler and Surmann, of Machinenbau Actien-Gesellschaft vormals Tigler, Meiderich, Rheinland.

The dryers specially recommended are the Trockenöfen of Schüchtermann und Krämer, Dortmund, Westfalia, and the Trockentrommel manufactured by Petry und Hecking, of Düsseldorf.

The briquettes made in this district are of two sizes, weighing 2 kilos (about 4½ pounds) and 10 kilos (about 22 pounds), respectively. The smaller kind is much more popular in this part of Germany, while in Switzerland the larger briquette is preferred. From 30 to 50 per cent of the fuel used on the State railways of Baden in 1902, and from 70 to 80 per cent of that used on the Swiss railways in the same year, are said to have been briquettes. For firing locomotives special advantages are claimed for this form of fuel, because of the ease with which it is handled and stored on the tenders and in the railway yards.

PRICES.

The cost of manufacture is dependent to some extent on local conditions and the equipment of the plant. It is stated to be from 12 to 15 marks (from $2.96 to $3.57) a car of 10 tons. This includes loading on the car. The present price of briquettes in this district to railways and factories is about 16 marks ($3.81) a metric ton (2,204.6 pounds).

NOTES.

It is not claimed for briquettes that they have the heating value of good screen coal, but that they utilize in a convenient manner a large amount of fine coal which otherwise is almost valueless.

It is stated that briquettes do not lose in quality by exposure to the weather. At the plant above referred to there is a pile of 60,000 tons of briquettes which has been exposed to the weather for two years. These briquettes are kept in stock in the event of strikes or of some unusual demand for coal. They show no signs of disintegration.

The limited supply of coal-tar pitch to be had and the fluctuations in the price of this product have led to trials of other binding materials for briquettes. Trials have been made with rosin and other ingredients, but with indifferent success. At this time pitch is looked upon as the only available material having the qualities required.

H. W. Harris, *Consul.*

Mannheim, *February 6, 1903.*

STETTIN.

There are only three plants manufacturing briquetted fuel in this consular district (embracing the provinces of Pomerania, West and East Prussia, and part of Posen). One of them, the "Hedwigshuette Anthracit-, Kohlen-, und Kokes- werke, James Stevenson, Actien-Gesellschaft," is located near Stettin, on the Oder River; another, the "Dominium Langenberg, F. Peters," at Langenberg, is also in the vicinity of this city, while the third, the "Königsberger Kohlen-Import und Steinkohlen-Briket-Fabrik, Actien-Gesellschaft," is at Königsberg, in Prussia, on the river Pregel.

AMOUNT MANUFACTURED.

The Hedwigshuette manufactures about 50,000 tons of briquetted fuel per annum, and gives continuous employment to from 30 to 50 persons. It is said that this company could greatly increase its output, the demand being greater than the supply. The Dominium Langenberg produces, it is estimated, from 7,000 to 8,000 tons annually. The Köningsberg plant the first year of its existence (about seven years ago) manufactured nearly 50,000 tons of briquettes, but as only 25,000 tons was disposed of, its output since that time has been quite irregular.

MATERIALS USED.

The Hedwigshütte makes briquetted fuels from coal dust, both bituminous and anthracite; the Königsberg company from dust of bituminous coal only, while the Peters, at Langenberg, utilizes peat alone.

All lignite briquetted fuel is shipped here from the southern provinces of Silesia, Saxony, etc. As bonding material for hard-coal briquettes coal pitch is used.

SIZE AND WEIGHT OF BRIQUETTES.

Briquettes from lignite coal average 28,000 to the carload (22,000 pounds), while the average of the so-called "Heiz-briquettes" for domestic use, produced at Königsberg and, to a smaller extent, at the Hedwigshütte, from dust of bituminous coal, is 98 briquettes to a centner (117.5 pounds). Most of the James Stevenson Company's product consists of hard-coal briquettes weighing, respectively, 6 and 3 pounds German (6.6 and 3.3 pounds). They are used for heating boilers of factories and by the smaller-sized locomotives.

METHODS OF MANUFACTURE—MACHINES USED.

In regard to the method of manufacturing briquetted fuel from turf and the kinds of machinery used, I would refer to the report of Consul John E. Kehl, of this city, dated October 26, 1898, and printed in Consular Reports of same year,[a] which covers the subjects thoroughly. It is almost impossible to secure information relative to the production of briquettes from coal dust, as managers of the factories refuse to give any details. The name of the firm that furnished the machines for the Königsberg plant is "Zeitzer Eisengiesserei, Maschinenbau-Actien-Gesellschaft," at Zeitz, Germany, which company, however, refused to give information or even to send a catalogue.[b] I suppose that the machines of the Stevenson concern are now of the same make; formerly, it used patented machinery (Koopmann system), but the cost of manufacture was too great.

SELLING PRICE.

For the reason above given, it is impossible to state the cost of production. The selling price for hard-coal briquettes of the larger sizes (3 and 6 pounds) is about 17 marks ($4.05) per ton, while for the smaller-size Heiz-briquettes it is 90 to 95 pfennigs (22 to 23 cents) per centner (117.5 pounds). Lignite briquettes are retailed at 85 pfennigs (20 cents) per centner.

The heating value of all kinds of briquettes is less than that of English coal. Briquetted fuel made from coal dust is unpopular, as it produces—owing, perhaps, to the binding material—a good deal of soot. Lignite briquettes, however, are in general use.

HENRY HARDER,
Vice and Acting Consul.

STETTIN, *December 10, 1902.*

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[a] Advance Sheets, No. 278, November 19, 1898 (Monthly Consular Reports, No. 220, January, 1899). The information contained in this report is covered by reports published in this series.

[b] See page 86.

NETHERLANDS.

AMSTERDAM.

No briquetted fuel made of coal dust or lignite is manufactured in this consular district. The briquettes used in the Netherlands are imported from Germany (Westphalia) and Belgium.

There is, however, in this country one factory that produces peat briquettes, and has an output of about 100 tons a day. But this fuel is comparatively new, and I am told the plant is not yet operated on a paying basis.

The selling price of the briquetted peat is 5 florins ($2.01) a ton at the factory, whence to Amsterdam the freight rate is $1.

The price of the imported coal-dust briquettes is 95 florins ($38.19) per 10 tons c. i. f. Amsterdam, and of the imported brown-coal briquettes, 85 florins ($34.17). Coal per 10 tons c. i. f. Amsterdam is quoted at 82.50 florins ($33.17).

These peat briquettes are manufactured by the Griendsveen Mosslitter Company, Limited, of Rotterdam.

Briquettes are used by the State Railway, the Netherlands Central Railway, and the waterworks, and also for household purposes.

Frank D. Hill, *Consul.*

Amsterdam, *January 23, 1903.*

ROTTERDAM.

There are no statistics available from which the quantity of briquetted fuel manufactured and used can be ascertained, and neither the manufacturers nor the importers of such fuel are disposed to furnish information in reference thereto; in fact, the majority of parties interested in the article decline to give any particulars at all.

The briquetted fuel industry of this country is as yet in its infancy and of little importance; still it promises, owing to the large area of peat soil in the Netherlands, to become one of the principal industries. The aggregate area of the peat fields is 126,152 acres, with a probable average depth of 10 feet. Some briquetted fuel is prepared from charcoal mixed with lime, but as these raw materials are not produced in the Netherlands, and as that fuel has to compete with a superior article imported from Germany (where charcoal, as a by-product of the chemical factories, can be purchased very cheaply), it is the general opinion that the charcoal-briquette industry is not a success here.

PEAT BRIQUETTES.

The manufacture of peat briquettes in the Netherlands has been inaugurated by the Griendtsveen Mosslitter Company, Limited, which owns a large area of peat fields and seems to be very successful.

This company, to which I am indebted for much of the information contained in this report, has informed me that briquettes are prepared from peat without any other material being added. The cost of manufacture can not be stated, as the manufacturers claim it depends entirely upon the situation and condition of the peat fields whence the raw material is derived. The wholesale price of peat briquettes is $2 per ton delivered on barge or truck at the works.

The method of manufacture is very simple. The peat is dried in the open air, being manipulated frequently, in order to eliminate as much moisture as possible. It is then sent to the peat mill, ground and again dried on large steam furnaces, freed from fiber, and pressed into small blocks under such high pressure that the material becomes solid without the addition of any binding substance. The presses used in the peat-briquette industry are supplied by the Dusseldorfer Eisenwerk Actien-Gesellschaft, at Dusseldorf, Germany.

The daily and also the maximum output of the plant is 100 tons. With well-constructed plants very little hand labor is required.

The plant is situated at Griendtsveen, Helenaveen Station, near Helmond, province of North Brabant.

As no patent law exists in the Netherlands the methods, processes of manufacture, and machinery are not patented in this country. The trade-marks of briquettes may, however, be registered and thus protected against imitation.

The heating value of peat briquettes is 5,000 calories. They have about five-sevenths of the heating capacity of average bituminous coal.

The following appeared in the Netherlands periodical, De Turf en Steen Industrie (The Peat and Stone Industry), in 1902:

PEAT AS FUEL FOR LOCOMOTIVES.

On the railroad from St. Petersburg to Warsaw, tests have been made with pressed peat as fuel for locomotives. A freight train consisting of 30 cars drawn by a locomotive using this fuel has covered the distance between St. Petersburg and Luga (about 84 miles) in the prescribed time. The fuel is now being used in the locomotives of passenger and express trains.

COAL BRIQUETTES.

The greater part of the charcoal and all the bituminous, anthracite, and brown coal briquettes used in the Netherlands are imported—the charcoal briquettes from Germany, and the coal briquettes principally from Germany but also from Belgium. No statistics exist as to the quantity imported.

Coal briquettes can be stored almost anywhere, even in the open air, for long periods without the quality or weight suffering in the least. They are not self-igniting, and they take up 20 per cent less room than the same weight of coal.

The average price for coal briquettes is: For bituminous coal, 9.25 florins (or $3.70) per 1,000 kilograms (2,204 pounds); for brown coal, 11.11 to 12.50 florins ($4.40 to $5) per 1,000 kilograms.

CHARCOAL BRIQUETTES.

These are manufactured on a small scale in the Netherlands by F. W. Hisschemöller & Son, Rotterdam; Elferink & La Roy, Vriezenveen; Asselbergs & Son, Bergen op Zoom; Nagtegaal & Son, Alfen on the Rhine; Minke & Kappert, Dedemsvaart.

The average price is from 16 to 17 florins ($6.40 to $6.80) per 1,000 kilograms (2,204 pounds).

S. Listoe, *Consul-General.*

Rotterdam, *March 10, 1903.*

NORWAY.

CHRISTIANIA.

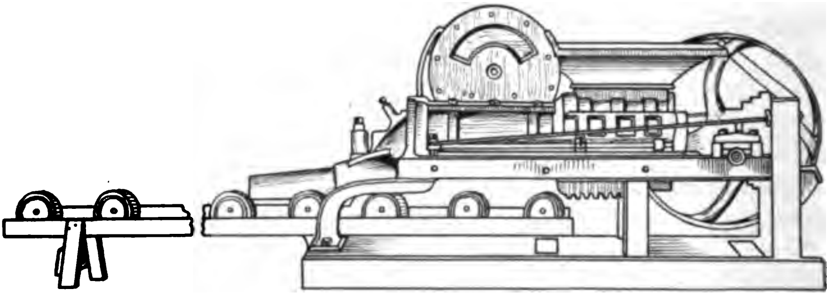
Coal has not as yet been discovered in paying quantities in any part of Norway, but peat of the best quality is found in abundance, and in some places is the only fuel used for domestic purposes. It is generally obtained in the old-fashioned way—cut with a spade, by hand, and in pieces about 12 inches long, 8 broad, and 3 thick. These pieces are placed diagonally in pairs on the ground in the open air, tops touching and bases apart, and in this manner dried, being frequently turned so as to expose all sides to the wind and sun. Sometimes they are also dried on rocks, where the latter are conveniently at hand. When properly dried the peat is carefully piled in heaps, each heap holding from a half ton to a ton and a half, and later, at convenience, hauled to sheds or storehouses for use as needed. The time and labor spent in the work is considerable. It is, however, attended to in the summer, at times when no other occupation is neglected. Much of the peat is dug by women and children.

During the last thirty years, there have been many fruitless attempts in different localities to utilize the peat bogs in a more economical manner. Of late, however, through the introduction of improved machinery, better means of communication, and better understanding of conditions, more satisfactory results have been obtained.

A society counting many prominent Norwegians as members has been formed for the specific purpose of utilizing the peat bogs, which in this country cover an area of about 10,000 square kilometers (3,861 square miles). The quantity and quality of the peat vary much, of course, in the different bogs, but some of the deposits are of the best quality and exceed 12 feet in thickness.

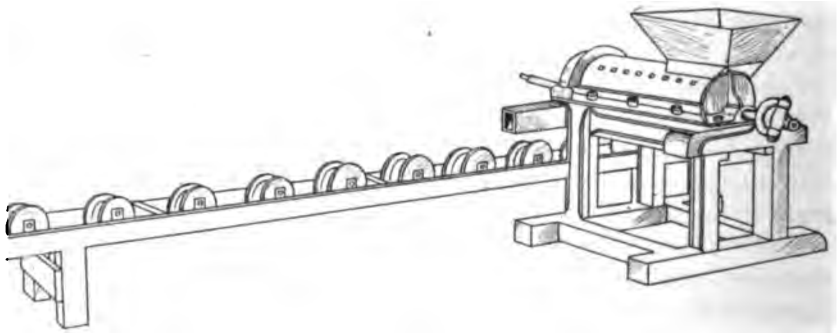
Peat briquettes are made and burned in several factories located where peat is easily obtained. The machinery used is built principally on the Anreps system; some is imported and some made at the machine shops of Aadals and Hasle Brug. Of the latter I give below illustrations and descriptions.

The product of these machines is known as "pressed peat." The process is quite similiar to that of brickmaking. The peat is dug from the bog and put into the machine, where it is ground, and then forced through a square spout out upon a moving platform, where it is cut into convenient lengths. Thereafter it is dried, either in the open air or artificially, until its volume of moisture is reduced to 20 to 25 per cent. It is estimated that 1.8 tons of pressed peat equals 1 ton of soft coal, for heating purposes, while a ton of peat made in the old way, by hand, equals only about one-third of a ton. The total cost of cutting, drying, and storing the peat will not, under ordinary conditions, exceed $1.60 per ton.



Peat making machine, No. 1. (Steam power.) 4 horsepower.

This machine requires a crew of 6 men, 8 women, and 2 boys. It delivers 20,000 pieces of peat per day. Its cost is 400 kroner ($107).



Peat making machine, No. 2. (Horse power.) 2 horses.

This machine requires a crew of 3 men and 5 boys or women. It produces 8,600 to 10,000 pieces of peat per day. Its cost is 350 kroner ($93).

A similar machine of smaller dimensions sells for 175 kroner ($47).

Attempts have also been made to manufacture coke from peat, and a plant for that purpose was built at Stangfjord, in the neighborhood of Bergen. The heating was effected by an electric current, the power for which was taken from a waterfall in the vicinity. Each kiln was loaded with 400 to 500 kilograms (881.8 to 1,102 pounds) of dried machine-made peat, and the coking required three to four hours. The electric current was of 500 amperes, with a tension of 40 to 50 volts; the temperature in the kiln was about 570° F. The coke was rather compact and burned with a bright flame—it was well suited for domestic purposes—and sold at Bergen for about $4 per metric ton. The plant, however, has for some reason shut down. A full description of this plant appears in the Scientific American of October 11, 1902, on page 237.

Peat in one form or another will, beyond doubt, gradually become more and more used for many purposes. Its production and utilization is at present in a more advanced stage in Russia, Denmark, and Sweden than in Norway. The pressed machine-made peat is, in all probability, the article which will prove of most value in the future. Peat is the only briquetted fuel used in Norway.

HENRY BORDEWICH,
Consul-General.

CHRISTIANIA, *December 20, 1902.*

SUPPLEMENTARY.

The question how to best utilize the vast Norwegian peat bogs is receiving much attention. After extensive experiments, experts have come to the conclusion that plants for carbonization of peat, where it is transformed into coke or coal, must be looked upon as failures. The cost of effecting the transformation is too great, and there is too much waste of material. Common hand or machine made peat is acknowledged to be the most promising article, and several manufacturing plants are now using it. To find the cheapest and best mode of preparation is the question.

For the purpose of studying the methods practiced in other countries, the machinery employed, cost of production, etc., the Government, in the year 1901, sent an agent to Sweden, Denmark, Germany, the Netherlands, Austria, and Russia. He has gathered much valuable information, as appears from a pamphlet just published, in which he gives an account of his experiences in the first-named countries. His report from Russia will appear at some future date.

I send under separate cover the pamphlet above mentioned.[a]

HENRY BORDEWICH,
Consul-General.

CHRISTIANIA, *March 13, 1903.*

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[a] The pamphlet (in Norwegian) is filed for reference in the Bureau of Foreign Commerce.

BERGEN.

Norway possesses an abundance of excellent peat. These deposits are, however, as yet practically untouched, which is remarkable, as the prices paid for anthracite and soft coals are high. The reason, however, why peat has been so little used in this country may be explained by the fact that the methods heretofore applied for carbonizing it were too costly. At present, it is too early to give any exact figures as to the amount of briquetted peat fuel manufactured and consumed annually, although it can be stated that the industry is gradually being developed.

Herr P. Jebsen, of Dale, Norway, has invented a process for carbonizing peat, which is said to be advantageous. It has been in operation during three years in peat-charcoal works at Stangfjord, which, I am told, are now closed on account of lack of sufficient capital.

The partially dried peat briquettes are, in accordance with this method, carbonized in hermetically closed retorts by electrical heat. Several retorts can be heated at the same time with one dynamo machine. The dynamos are driven by water-power turbines, and the process allows the peat blocks to be carbonized within a short time and with great uniformity, while the peat charcoal produced consists of a dense black mass, showing the structure of peat. In broken condition, the specific gravity of the carbonized fuel is about 0.3 and the theoretical calorific value 7,000 to 7,500 thermal units. It burns excellently, yielding but little soot, and gives a rapid and strong heat. The ash does not retard combustion as do the ashes of lignite and coals.

Following is an analysis of this fuel from the Royal Norwegian High School at Christiania:

	Per cent.
Carbon	76.91
Hydrogen	4.64
Oxygen	8.15
Nitrogen	1.78
Sulphur	.70
Ash	3
Moisture	4.82
Total	100

The power for carrying out the treatment at Stangfjord is derived from five 80-kilowatt dynamos coupled direct to five turbines. This part of the plant was installed by Schuckert & Co., of Nuremberg, Germany. By the aid of mechanical power, the boats are discharged and the peat submitted to the first drying and pressing operation. This is performed in a 5-horsepower press which can burn out about 2,500 blocks of peat per hour. The weight of the dried peat in these blocks is about 4.4092 pounds. The partially pressed and dried peat briquettes are next loaded into trolley shelf wagons, each carrying 140 briquettes placed on ten shelves. When loaded, these wagons are pushed into the cooler end of the drying tunnel.

The air draft passing through the tunnel is heated by the waste gases from the retorts and set in motion by the means of electrically operated fans. At the top-end of the tunnel, where the wagons emerge, the temperature of the air is 90° to 100° C. and at the lower end where they enter, 40° to 50° C. The peat is thus submitted to a gradually increasing temperature as the wagons pass up the tunnel. The loads of dried peat are next taken on tram rails direct into the retort house and emptied into the retorts. One hundred and two shelf wagons, two tunnels, three electric fans, and one hot-air stove composed the drying plant at Stangfjord, which is said to have been able to produce 1,000 air-dried peat blocks a day.

The retorts consist of upright cylindrical vessels of iron, about 6 feet 6 inches in height and 3 feet 3 inches in diameter. Each retort is provided with a removable cover, a discharging hole below, gas exit pipes, and a pressure gauge. The retorts have spiral resistance coils, so constructed that the peat blocks can be built up in contact with them until a pigeon-holed mass of peat entirely fills the retort, in the center of which the heating agent lies. The top cover of the retort is now clamped down and the electric currents turned on. When submitted to this electrical process in closed retorts, the peat will yield three products. Openings in the retort cover allow the exit of the gaseous products, which are used for heating the air in the drying tunnels.

After this carbonizing operation has been completed, the remaining peat fuel is allowed to cool down to 130° C. The retort is then opened and the peat discharged into wagons.

Before the Stangfjord factory was closed its products were sent to Bergen, where they are said to have been in great demand.

At present, there is but one peat plant in operation in this consular district, the name of which is Fedje Forvbrug. It is located at Fedje and is a small concern started a short time ago. Its products are sent to this city and retail at about kroner 1.10 ($0.29) per hectoliter (2.838 bushels). I bought a few sacks of these briquettes for trial, but they are poorly made, the process being no improvement upon that in use about thirty years ago, when the same kind of fuel (torv), although superior, was bought from the farmers of Sweden.

VICTOR E. NELSON, *Consul.*

BERGEN, *January 15, 1903.*

SPAIN.

BARCELONA.

The manufacture of briquetted fuel in Spain is centered in the province of Asturias. It is estimated that about 165,000 tons of briquettes are produced annually, the whole of which is consumed in this country. They are made from washed small coal, either anthracite or bituminous, according to the location of the works; the greater portion is, however, semibituminous.

With regard to the cost of production the ton, I find that the works which use small coal from their own collieries roughly estimate it as follows:

Description.	Spanish currency.	United States currency.
	Pesetas.	
Small washed coal delivered at works	9.00	$1.35
Pitch (as an agglomerant)	1.80	.27
Labor	1.60	.24
Interest and amortization	1.80	.27
Total	14.20	2.13

The present nominal price is 20 pesetas (about $3) the ton. There is, however, little if any sale of the product in the open market, as Spanish briquetted fuel is unable to compete with that of British manufacture; its consumption is confined to the railroad companies, under contracts.

The method of manufacture is as follows: The coal, after being washed, is run through crushing rollers and ground fine; it is then passed into hoppers, together with the necessary proportion of pitch, whence, after being treated by steam, it is fed automatically into the presses. The only agglomerant employed is pitch, which is principally imported from Great Britain. Neither lignite nor peat is used for briquettes. Lignite is not found in Asturias, and though there are extensive peat beds in the country, they remain untouched, owing to the lack of transport facilities.

Following is a list of the existing works:

1. Sociedad Carbonera de Lena—La Cobertoria, at Pola de Lena; uses anthracite coal and the Dupuys system of machinery; has a daily output of 30 tons, with 5 men employed for each machine. The briquettes made weigh from 2 to 15 pounds. This concern works exclusively for the Andalusian Railroad Company.

2. Sociedad Hullera Española, of Ujo; owns two works with Bouriezs system; uses semibituminous coal; sells chiefly to the North of Spain Railroad Company. Its output amounts to about 125,000 tons per annum.

3. Sociedad Hullera del Turon, of Turon; employs the Bietriz-Couffinhal system; uses semibituminous coal; has an annual output of about 20,000 tons.

4. Sociedad Fábrica de Mieres, at Mieres; employs the Mazeline system; uses bituminous coal; manufactures briquettes solely for its own locomotives and boilers.

5. Sociedad Pola & Gilhou, at Gijon; employs the primary English system; uses bituminous coal; manufactures briquettes exclusively for the Langreo Railroad Company.

JULIUS G. LAY, *Consul-General.*

BARCELONA, *February 21, 1903.*

MALAGA.

Briquetted fuel, in the accepted meaning of the term, is not manufactured in this consular district. It is secured elsewhere and is used by the French railroad operating in the provinces of Malaga, Granada, Jaén Cordova, Seville, and Cadiz. The director of the railroad company informs me that in Malaga city, between 75,000 and 80,000 tons of coal are consumed annually, of which 20,000 tons are briquettes. This fuel is manufactured by the Sociedad de Explotacion de las Minas de Belmez, province of Cordova. The mines at that place and the adjacent briquetting plant are owned by the railroad company. The Cordova plant is by far the most extensive in this vicinity, and it furnishes briquetted fuel for the entire southern section of Spain.

A composition that may be construed as a form of briquetted fuel is manufactured and used extensively in Malaga. It is known as "Paris coke," and is becoming so popular that within the past few years, two local plants have sprung into existence to compete with the one manufacturer who had heretofore enjoyed a monopoly of the trade. This fuel is composed of a mixture of 90 per cent of charcoal and 10 per cent of coke, to which is added 7 per cent of pitch. The mass is then molded by what is termed a "compressed-coal machine," which produces circular briquettes 3½ inches in length and 1 inch in diameter.

The process of manufacturing "Paris coke" differs but little in the local plants, and the cost is much the same—12 pesetas (about $1.70) for 92 kilos (202.82 pounds). It is also retailed in small quantities at one-sixth of a cent a brick.

The three local manufacturers are Miguel Muñoz, Manuel Molina Lugue, and Alberto Garcia Gutierrez. The first is the leader in the trade in Malaga, the output of his plant for the past eight months being 1,840 kilos (4,056 pounds) per diem. The others produce less.

The machines used are of French manufacture and are capable of pressing 10,000 kilos (22,064 pounds) in twelve hours.

"Paris coke" is sold almost exclusively to the poorer residents of Malaga, who use it for cooking purposes. It is cheaper than charcoal, the only other commodity employed in cooking, but the one strong objection to it is that while its heating property is lasting, it is a trifle too solid to ignite quickly. The bricks are not used for heating purposes, nor is any other fuel for that matter, the people seemingly being content to live in damp stone houses during the short winters without fire of any kind.

This form of fuel has not as yet been utilized by industrial establishments.

D. R. Birch, *Consul.*

Malaga, *January 21, 1903.*

SWEDEN.

GOTHENBURG.

The manufacture of briquetted fuel in Sweden has not yet passed from the experimental stage, and therefore does not appear in any official statistics. Consequently it is impossible to state the quantity produced, number of workmen employed, amount of money invested, cost of manufacture, or price of the finished product.

Peat is the chief raw material that could be used for briquette making in this country, and of late years the Government, and private individuals, have paid much attention to the problem of utilizing it in some form or other as fuel for factories and railroads. The results of these official experiments have not, however, been made public.

Sawdust, also, has been considered as a raw material that might with success be used for briquetting purposes. But it is said that such briquettes, on account of their density, do not burn readily.

In making coal briquettes, the coal is pulverized, refined, and then pressed into blocks. The Government factory is located at Elmhult. Its annual production is only about 30,000 tons, while the State railroads consume nearly 550,000 tons of coal per year.

The peat briquettes mostly used in Sweden are what might be called a half-manufactured product—that is to say, the wet peat is by simple machinery cut up into pieces about the size of small bricks and then air dried. The price of this fuel in Gothenburg is about 17 cents per hectoliter (2.838 bushels).

Swedish inventors have also endeavored for several years past to produce charcoal from peat, but apparently without economical results.

One of these inventors is an engineer, C. E. Laurenius, of this city. With regard to the peat coal produced by his process, I append translation of an analytic statement from the Royal Technical High School at Stockholm. As regular manufacture on a large scale has not been started, the market price of this coal can not be stated.

I beg to close this report by quoting an article printed in Göteborgs Aftonblad November 29, 1902, of which the following is a translation.

> Engineer Alf Larsson, at a meeting of the Association of National Economy at Stockholm, yesterday gave a lecture upon the use of our peat bogs. He said in part:
>
> "Russia yearly produces 4,000,000 tons of peat, and the Russian Government receives $938,000 per annum for leasing peat bogs. Germany produces 2,000,000 and Holland 1,000,000 tons. Austria, Denmark, Iceland, and other European countries also utilize their deposits of this cheap fuel. Here in Sweden, the production of peat for fuel is about 1,000,000 tons a year.
>
> "Peat can be recommended as a very good fuel, and its preparation gives employment to many persons in this country. Near Falköping, for instance, about 1,000 persons are each summer employed in the industry. Peat can also be utilized as fuel by the paper mills, glassworks, ironworks, brickkilns, and especially in the households. The Government engineer for the peat industry estimates the supply of peat in Sweden to be 4,000,000,000 tons. The peat question is at present the most important problem in Sweden. The Government has done some experimenting in the matter, with good results, but very much remains to be accomplished. * * * If the production of peat in Sweden amounted to 5,000,000 or 6,000,000 tons per annum, and the peat were duly recognized and used as a fuel, it would directly or indirectly bring this country a yearly profit of $26,800,000."

ROBERT S. S. BERGH, *Consul.*

GOTHENBURG, *January 10, 1903.*

MATERIAL-TESTING DEPARTMENT OF THE ROYAL TECHNICAL ACADEMY.

[Certificate No. 3223. Samples Nos. 17040–17043.]

Testing of the chemical composition and heating amount. Testing objects: One sample of peat, 3 samples of peat charcoal. The samples arrived October 18, 1901.

The tests have given the following results:

Composition.	Peat, No. 17040.	Charcoal.		
		No. 17041.	No. 17042.	No. 17043.
Moisture .... per cent..	11.8	2.12	2.62	1.74
Dry substance:				
Carbon .... do......	54.4	60.40	63.10	87.30
Hydrogen .... do......	6.18	5.06	5.15	4.22
Oxygen and nitrogen .... do......	34.10	32.10	28.00	4.02
Sulphur .... do......	....	....	.08	.10
Ashes .... do......	5.32	2.44	3.67	4.26
Total .... do......	100	100	100	100
Percentage of phosphorus in the ashes .... do......	....	....	2.23	2.31
Heating power per kilo, dry substance ..... calories..	5,280	5,830	6,020	7,410
With regard to the coaling the following data have been given by the sender:				
Outturn of charcoal .... per cent..	....	91.2	83.8	70.6
Duration of coaling .... hours..	....	7	6¼	11¾
Temperature during the coaling .... ° C..	....	180	200	230

PEAT INDUSTRY IN SWEDEN.

It is known that Sweden possesses great wealth in her peat bogs, which are only awaiting development. The peat production of the world amounts at present to from 9,000,000 to 10,000,000 tons a year. Russia comes first with about 4,000,000. Peat is used there for locomotives as well as in the factories. One of the largest cotton works in the world is located in Russia, and it uses peat exclusively as fuel. Most of the peat fuel of Sweden is used in the homes, but some is employed for industrial purposes. There are, for instance, in the province of Skåne, two factories using peat exclusively as fuel.

The quality of the Swedish peat is excellent, yielding an inconsiderable percentage of ashes. Moreover, the moors of Sweden are high and easy to drain. No other European country, excepting Russia, possesses such an abundance of good peat.

The next important question is the cost of manufacture. According to one calculation (in 1901) this is on an average 3 kronor (80 cents) per ton for unsheltered peat, to which must be added 1 krona (27 cents) per ton for transport and shelter. This would make the cost of the peat at the place of consumption 4 kronor ($1.07) per ton, which is equivalent to coal at 8 kronor ($2.14) per ton.

For machine-made briquettes, the rate (free on cart from the moor) was 5 to 6 kronor ($1.34 to $1.61) per ton.

Compared with the present prices for wood and coal, peat is unquestionably the cheapest fuel. One cord of pine wood must not cost more than 4 kronor ($1.07) if it would compete with peat at the abovementioned rate. If 1 ton of hard coal is equal in fuel value to 1.8 tons of peat (the trial results vary between 1.6 and 1.8), the calculated peat price would be equal to a coal price of 10.80 kronor ($2.89) per ton—a price at which coal can not be bought in Sweden. The Government railroads, which are the largest consumers of coal in this country, and consequently are able to buy cheap, have during many years paid on an average 14 kronor ($3.75) per ton at the port of landing.

The Government and Parliament manifest comprehension of the great importance of the peat industry. The trials of firing with peat on the Swedish Government railroads have, according to the official report, shown that peat is about as expensive as English stone coal, when the rate is 9.50 kronor ($2.50) for the former and 16 kronor ($4.29) for the latter, exclusive of freight charges and the cost of loading on the tenders of the locomotives.

VICTOR E. NELSON, *Consul.*

BERGEN, *March 7, 1903.*

UNITED KINGDOM.

LIVERPOOL.

Only about 2,000 to 3,000 tons of briquettes are annually manufactured in this consular district. They are made by a firm in the town of Wigan, from bituminous-coal dust, and are used almost entirely for local domestic purposes. The retail selling price is about 20s. ($4.86) per ton. I have been unable to obtain the cost of production and the other particulars desired. Such information would not afford any criterion for comparison with what is done elsewhere, where the manufacture of such fuel is carried on upon a large scale, as in South Wales.[a]

JAMES BOYLE, *Consul.*

LIVERPOOL, *December 2, 1902.*

MANCHESTER.

After many inquiries, I have learned from the largest colliery proprietors in Lancashire that briquetted fuel is not manufactured in this consular district, the chief centers of production being Swansea and Cardiff.[a]

The few briquettes used in this district are made by the Whitfield Colliery Company, of Staffordshire. They are about the size of an ordinary brick and their chief component is coal dust (slack), with a little tar added. The price, delivered here, is 10s. ($2.43) for 300 briquettes.

WM. F. GRINNELL, *Consul.*

MANCHESTER, *December 17, 1902.*

NEWCASTLE-ON-TYNE.

Briquetted fuel is not now manufactured in this district nor in the districts of Carlisle and West Hartlepool. Some years ago, the pit heaps of waste coal in the north of England were utilized in conjunction with tar for this purpose, but, the supply of coal dust becoming exhausted, the industry was abandoned. Briquettes never were a success as a commercial commodity in this coal-mining district, coal being quite cheap here.

At Sunderland, the Wear Fuel Works Company, Limited, until recently made these blocks. The annual output was in number from

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[a] A report describing the manufacture of briquettes in Wales was printed in Consular Reports No. 222, March, 1899. The methods in use are those employed on the Continent, full details of which are given in this series.

50,000 to 100,000. The materials used were bituminous coal dust and pitch, the latter for binding purposes.

The cost of manufacture depended entirely on price of raw material, which varied greatly from year to year. For example, bituminous coal dust runs from 5s. ($1.22) to 8s. 3d. ($2.01) per ton and pitch 19s. ($4.62) to 30s. ($7.30) per ton. At present, however, the latter is quoted at 55s. ($13.38), which is abnormally high. The cost of labor varied according to output.

The selling price of this fuel was generally equivalent to that received for best coal.

The briquette presses were mainly constructed by the company itself, and two kinds were used, viz, trough and table. Neither the machinery nor the process is patented.

The capacity of the plants was equivalent to about 50,000 briquettes per year of two hundred and fifty working days, of twelve hours each.

One of the briquettes that was manufactured by the above-mentioned company evaporated 14.4 pounds of water at 212° F., while the best North Country steam coal averages 14 pounds of water to 1 pound of coal.

PEAT FUEL.

There is a great future for peat as fuel. The most productive area for it is the north of Germany and the adjoining parts of Denmark and Holland. In Friesland, there are bogs hundeds of square miles in extent, and Germany has more fuel in peat than in coal. It is said that a square mile of bog 10 feet deep contains peat equal in heating power to over 300,000 tons of coal. Ireland has 1,000,000 acres of large bogs from 10 to 30 feet deep.

H. NIXON,
Vice and Deputy Consul.

NEWCASTLE-ON-TYNE, *December 6, 1902.*

NOTTINGHAM.

No briquetted fuel is made or sold in Nottingham. This city is in a coal-mining district and fuel is relatively cheap. Being informed that two colliery companies in other parts of this consular district were making briquettes, I wrote them on the subject. One of the companies has not replied. The other writes as follows:

> The cost of manufacture with us is now about 12s. ($2.92) per ton, pitch being very dear at the present time. Our average selling price is now about 12s. 3d. ($2.98) per ton.

FRANK W. MAHIN, *Consul.*

NOTTINGHAM, *December 23, 1902.*

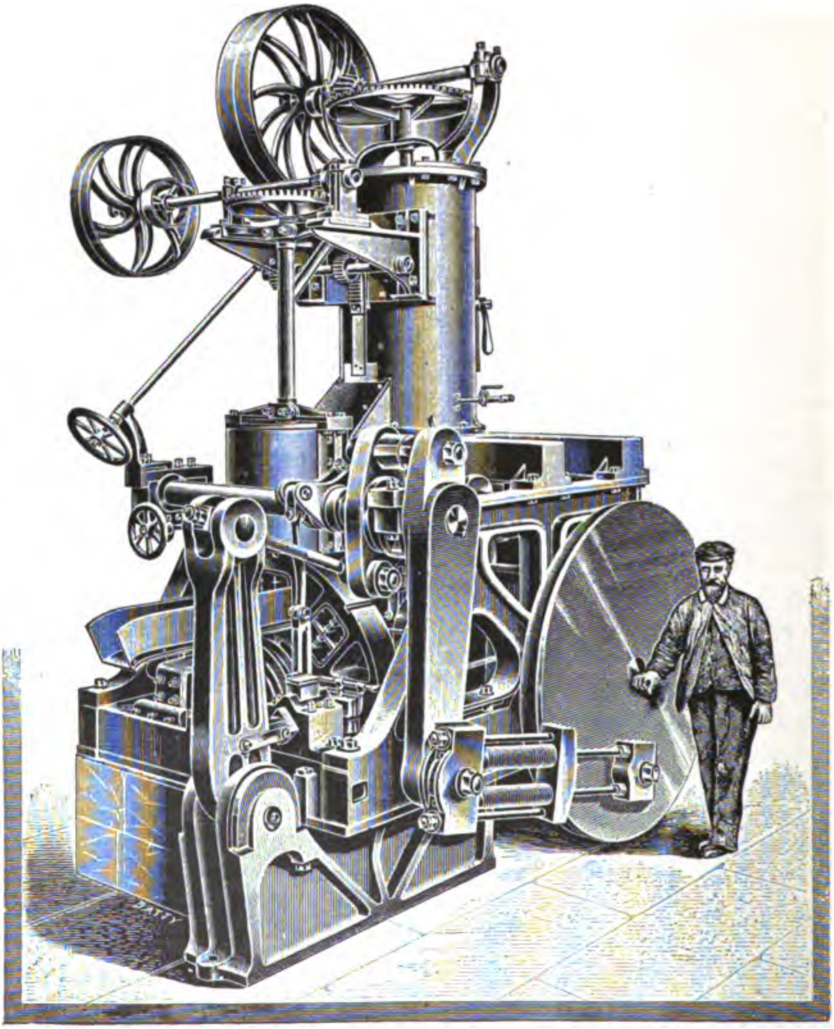
EDINBURGH.

Briquetted fuel is produced at only one place in this district—the gas works recently completed by the Edinburgh and Leith corporations gas commissioners, at Granton, a suburb of Edinburgh. Mr. W. R. Herring, manager for the gas commissioners, in planning the new works, aimed to bring together all modern facilities and economies adapted to a gas-making plant, and in pursuit of this idea he added briquette machinery for the purpose of utilizing the coke siftings, a residuum of gas production heretofore wasted.

This briquette plant, with the necessary iron framework, etc., was erected at a total cost of $5,000, the price of the machine being $2,250. It has a capacity of 5 tons per hour. From the coke sifters of the gas works, the dust siftings are conveyed in small cars or wagons running on a light railroad to the briquette plant (about 100 yards away) and put into the hopper, and through another hopper common pitch is added as bonding material. To show the process of briquetting fuel at Granton, I give illustrations, the first representing the briquette machine proper and the second a longitudinal section of the entire plant (pp. 130 and 131).

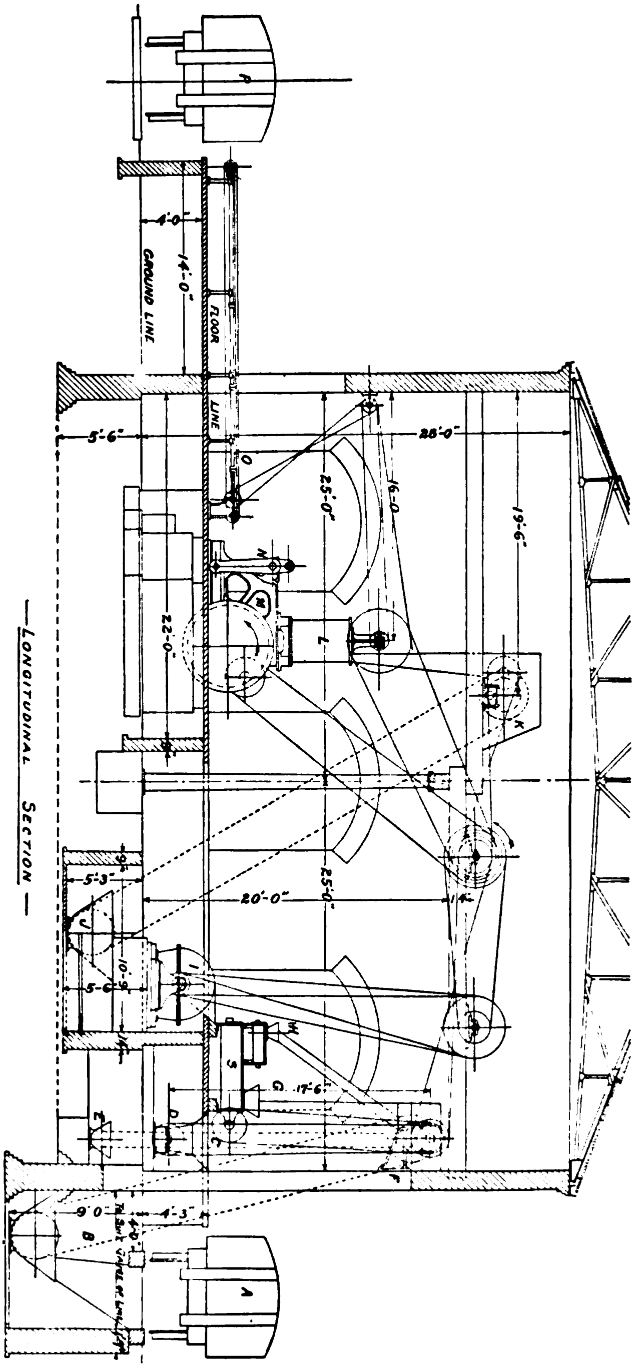
The coke waste passes from the car or wagon (A) to the elevator (B) and is carried to F, whence it goes into the coke measurer (G). The pitch is put in the hopper (C) to the pitch cracker (D), and by the elevator (E) is conveyed to F, whence it goes to the pitch measurer (H). The materials pass to the mixer (S) in the required proportions (8 per cent of pitch is used at Granton), and from the mixer to the disintegrator (1), where they are pulverized; thence by the elevator (J) to K; thence to the vertical heater (L) of the briquette machine, where they are thoroughly fused by steam; thence to the pugmill (M). From this they are fed into the mold-plate in measured quantities. In the molds, the briquettes are pressed on both sides simultaneously, the pressure applied equaling about 2 tons per square inch. They are turned out of the mold-plate to the trucking belt (O) and pass to the car or wagon (P).

This briquette plant has been in operation for several weeks, with satisfactory results, barring a tendency to clog when the material is a little too wet. The labor cost of the product is approximately 35 cents per ton, the cost of pitch about 90 cents per ton, and interest on capital invested not more than 1¼ cents per ton, making a total of $1.26¼ per ton. The price of pitch is extremely high at the present time—$11.40 per ton; ordinarily it does not exceed $7. The cost of the power necessary to run the machinery is too small to be estimated, as the steam comes from the boilers of the gas works. The briquettes, which weigh 4 pounds each, are ready for immediate use as fuel, although it improves them somewhat to lie a week or ten days in the open air. In Mr. Herring's opinion, a coke-dust briquette has considerably more heat value than the same weight of the best coal. It was his original intention to use the briquettes in the furnaces of the gas works, but he finds that it will be better economy to place this fuel on the market for household purposes at $2.50 per ton, which price will yield a good profit.



Johnson briquette machine.

I am informed that this is the first briquette plant to be erected in the United Kingdom in connection with gas works. It is the Johnson system (William Johnson & Sons, Leeds), patented, I believe, in the United States as well as in this country. The machinery is said to be adapted also for lignite, bituminous, and anthracite coal, charcoal, and



— LONGITUDINAL SECTION —

peat, and for iron or other ores for smelting purposes. The sizes and weights of the briquettes produced can be modified as required to suit different markets or uses. The ordinary briquette plants of the Johnson pattern, as used for producing coal or coke briquettes, contain these items:

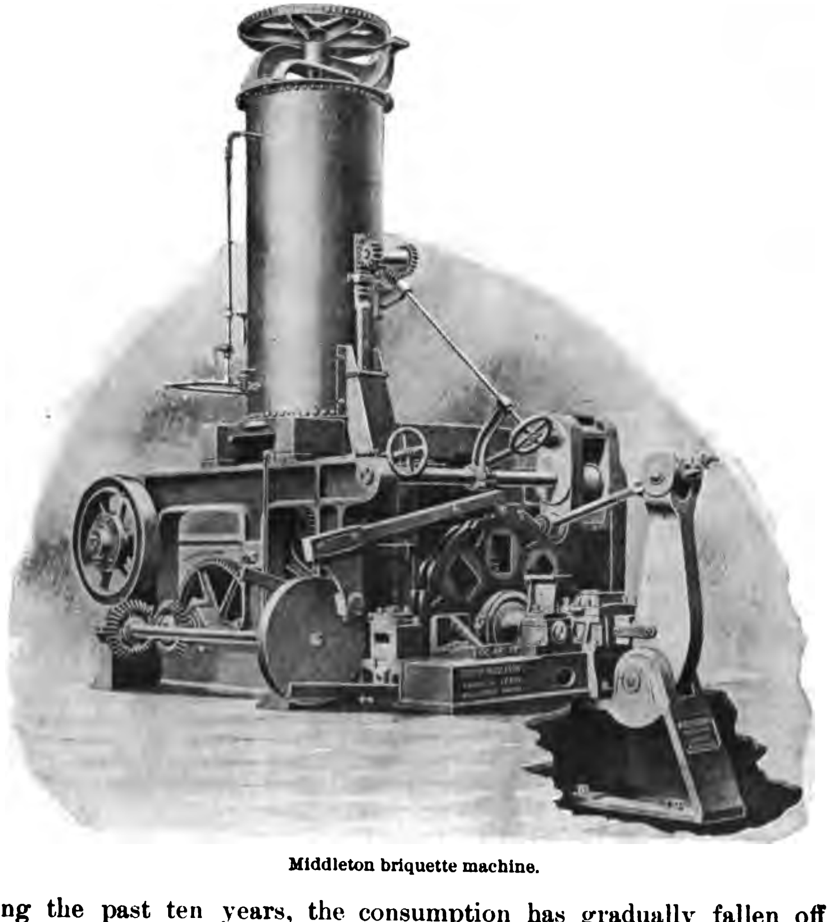
1. Chain elevators, fitted with steel links and buckets, chain pulleys and tightening gear, iron-bottom box, gearing and driving pulleys, for elevating small coal or coke into the mixer.
2. Pitch cracker, fitted with hopper, circular grate, steel breaking knives, frame and driving pulley, for breaking up the pitch; also set of small elevators for raising the broken pitch into the mixer.
3. Mixer or measurer, fitted with horizontal cylinders, adjustable blades, change wheels, and driving gear, for mixing coal or coke and pitch in the proper proportions.
4. Disintegrator, fitted with steel shafts, phosphor-bronze bushes, hardened-steel bars, wrought-iron disks, and iron covers, for pulverizing the coal or coke and pitch.
5. Chain elevators, for conveying the ground coal or coke and pitch into the vertical heater.
6. Superheater, for superheating steam, fitted with internal heating pipes and pyrometer.
7. Vertical heater, fitted with internal shaft, steel knives, inlet steam pipes and taps, regulating outlet, gearing and driving pulleys, and iron girder frame.
8. Briquette machine, fitted with feed, compressing, and rounding motions, producing briquettes uniform in thickness and weight, pressed on both sides simultaneously with a pressure of 2 tons per square inch by simple combination of lever and fly wheel.
9. Endless carrier, with standards, frames, rollers, endless belt, and driving motion, for conveying finished briquettes to the outside of the machine house.
10. Shafting, including the main driving shaft, countershafts, driving pulleys, standards, couplings, pedestals, inside the machine house.

Plants are made in four sizes: No. 1, for producing 25 tons per ten hours; No. 2, for producing 50 tons per ten hours; No. 3, for 100 tons, and No. 4, for 200 tons.

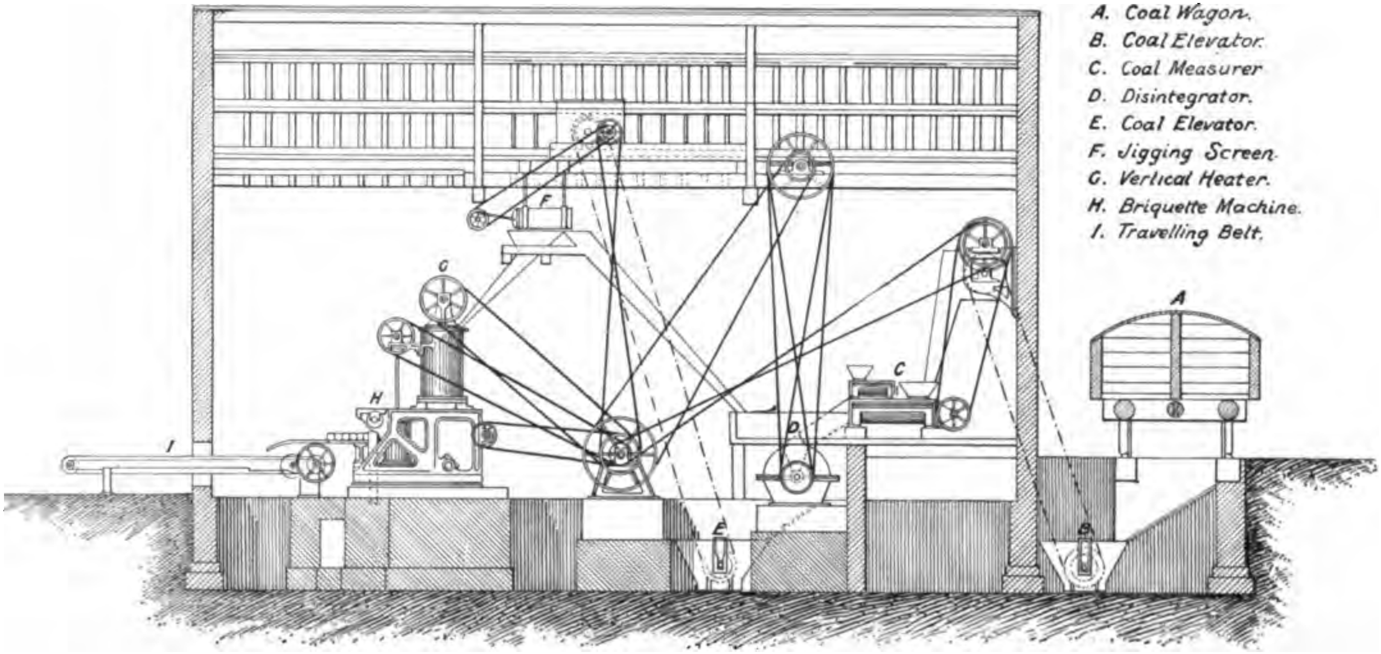
Other patterns of briquette machinery in use in the United Kingdom, drawings of which I have examined, do not differ widely from the Johnson system in principle or operation. One of these patterns is the Middleton (Robert Middleton, Leeds), well known in the coal and briquette trade, especially in England and Wales. This machine also applies pressure to the briquettes on both sides simultaneously. I give an illustration of the machine, and also a print from a drawing of a longitudinal section of a Middleton plant producing 5 tons per hour (pp. 133 and 134). The price of the briquette machine alone is

$3,300. Price of a briquette plant (exclusive of engines and boilers) completely installed, about $6,900. The Middleton machine is, I am informed, protected by patents in Great Britain and the United States.

Coal briquettes for household use were first made in 1877. For many years the industry has been chiefly carried on in Wales, where the coal screenings are better adapted for this use than is any other quality of coal produced in the United Kingdom. Ever since it was introduced, this fuel has been on the market in east Scotland. During the past ten years, the consumption has gradually fallen off. Colliery owners in this district (where the coal is all bituminous) who installed briquette plants stopped the manufacture some years ago, as the local demand was not sufficient to warrant its continuance, especially in competition with the larger producers in west Scotland and north England. At the present time, the quantity of briquettes consumed is very small, in comparison with coal—almost inconsiderable. Practically, they are used only to keep fires overnight and in sick



Middleton briquette machine.



Longitudinal section, briquette plant—Middleton system.

rooms where low fires are wanted in moderate weather. Unbroken, the ordinary briquette makes a slow and dull fire; if broken up, it is soon consumed. My inquires have not elicited a favorable opinion, either from coal and briquette dealers or from those who have used briquettes, as to this kind of fuel for general household consumption. It seems to be regarded as neither economical nor in other respects satisfactory, compared with bituminous coal. It was originally supposed that the use of a small quantity of this briquetted fuel in a grate with coal was economical—i. e., prevented the rapid consumption of the coal. In the opinion of householders whom I have questioned on the matter, this idea has been exploded. One gentleman who uses in his house a ton of coal every nine days related to me an experiment which he made with briquettes. He first bought 24 small blocks (5½ pounds each), costing 30 cents; these were used with a ton of coal, one briquette being put on a grate now and then to "slow down" the fire, and the ton lasted no longer than usual. He then doubled the number of briquettes, and the ton of coal was consumed in the same time as before. Then he used $1.20 worth of briquettes with a ton of coal, and the result showed no saving.

A special objection to coal briquettes with pitch as the bonding material is that they foul chimneys quickly. This is the testimony of chimney sweeps.

The retail prices of briquettes and coal in this city (delivered) are as follows: Briquettes, $5.52 per ton; 100 large blocks (11 pounds) or 200 small blocks (5½ pounds), $2.75; 12 large or 24 small blocks, 30 cents. English household coal, $6.95 per ton; Scotch household coal, $5.28. It thus appears that briquettes are higher in price than is Scotch coal, principally owing to the much longer railway haul.

Neither peat nor lignite is found in commercial quantity in this district.

RUFUS FLEMING, *Consul.*

EDINBURGH, *December 16, 1902.*

PEAT FUELS OF EUROPE.

The following article, contributed by Adolf Dal to the London Engineering Magazine for November, 1902, is sent by Consul Fleming, of Edinburg:

[While primarily of importance in countries where the cost of labor is low and the necessity for economy is acute, the use of peat is not without its industrial significance. It is reported that even in the eastern United States, resort has recently been had to peat fuel under pressure of famine prices for coal. The suggestion of its more extended use by the establishment of a power plant close to the source of supply, with power distribution thence by means of fuel gas or electricity, is particularly interesting and in direct line with the best modern practice in the economical utilization of natural resources.—THE EDITORS.]

Peat has long been used as fuel; in Germany especially, its use dates back so far that the ancient Roman naturalist, Pliny, tells us that that Teutonic tribe on the borders of the North Sea dried and burned "mud" (peat). Its more extensive use dates from the middle of the last century, when fuel for steam engines was required on a larger scale; and in very late years, high prices of coal have attracted renewed and most active attention to the use of peat fuel.

The bogs in which peat is contained cover extensive areas in the northern temperate latitudes, both in Europe and in America. In Germany, they cover nearly 30,000 square kilometers (11,583 square miles), and in Ireland, according to Lyell, they cover the tenth part of the country. The depth is very variable, but is on an average 5 to 7 meters (5.4 to 7.6 yards) and more; thus in Ireland, bogs are found with a depth as great even as 15 meters (16.3 yards). It may be estimated that 1 square kilometer (0.3861 square mile) of 5 meters (5.4 yards) depth will give about 700,000 metric tons of dried peat; hence it will be seen that the amount of fuel in these bogs is enormous.

Peat is all organic matter, formed from mosses and other minor plants which have been submerged in water and thus preserved in the bogs. As it exists in the bogs the largest constituent is water, dry matter forming only about 10 per cent of the total weight. When peat from the bogs is used for fuel, therefore, much water must be removed, and this forms a great difficulty in the manufacturing. In fact, the drying of the peat is everywhere regarded as the most troublesome point, for it is impossible to remove the water economically in any artificial way, either by pressure or by heating in kilns or kiln-like appliances; the peat must be dried in the open air, and the preparation thus becomes much dependent on the climate. In level, open countries, however, where the wind is constantly blowing, the drying in ordinary years will be very well performed. In almost all districts, the peat is spread out to dry in the open on the leveled and evened surface of the bog; only in certain very rainy countries, as in southern Bavaria, Styria, and in western Norway, shelters are sometimes used. Peat dried in the air will hold about 20 per cent of water.

The most ancient method of digging peat, still much used, is the simple one of cutting it by hand with a spade in regular, rectangular pieces, which are then spread on the leveled surface of the bog and dried. At present this method is much used in the Netherlands and in Germany. Although it requires much labor, yet it will often give a very cheap fuel, especially where wages are low, a skilled laborer being able to work 1 metric ton of dried peat in a day. Probably the larger part of the peat produced in the countries just named is such "cut peat." But as wages grow higher, this method will tend to fall into disuse.

Cut peat, however, is of somewhat loose consistence and has an excessively large bulk, a hectoliter of it weighing on an average 20 kilograms (12 pounds to the cubic foot). As it takes 2 pounds of peat to equal 1 pound of ordinary coals, it will be seen that 8 cubic feet of cut peat must be used to equal 1 cubic foot of coals. Hence it follows that transportation will be costly, and storehouses and fire rooms must be very large where this peat is used.

In order to reduce the volume, peat-milling machines have been commonly introduced into all European countries within the last fifty years. In these machines the fibrous structure of the peat is broken up, the mass kneaded, mixed, and somewhat pressed together; it contracts considerably in drying, the volume of the dried peat often being only one-eighth of the original. Thus the peat gains a very compact consistence, and bears a close resemblance to lignite, both in appearance and density. The specific gravity often surpasses that of water; most commonly, its weight is about 40 kilogrammes per hectoliter (30 to 40 pounds to the cubic foot). In this form the peat may be transported, its weight giving a full wagon load. Nor is the machine-made peat so hygroscopic as the cut peat; it may be easily stored without absorbing water. When dried in the air, it contains 15 to 25 per cent of water.

Most of these machines knead the peat as it is taken from the bog. The machines thus used consist of a hollow cast-iron cylinder or cone, in which rotate one or two rollers set with knives or screw ridges, which break up the peat, mix it, and, lastly, press it through a mouthpiece, which it leaves in the form of a continuous rectangular block. This block is wet and soft as the peat in its natural state, and is cut in pieces at proper lengths and then carried off to dry. Peat made in this manner is often called on the Continent "compressed peat" (in German, "presstorf"), but it is evident that the pressure has been very slight; no water has been pressed from it, and its chemical composition has not changed; the only change is the increased density.

The first of these machines were constructed in 1861, by C. Schlickeysn, in Berlin, and though since then modified in various respects, they are still, on the whole, much like the original model. The most modern and most improved are those from the Munktells factory, at Eskilstuna, in Sweden, constructed by the Swedish engineer Aleph Anrys (p. 138). Several hundred of these machines are in use in Sweden, and especially in Russia. On the large bogs of the latter country, often up to 20,000 acres in extent, 50 to 70 machines of this kind may be seen at work. Each machine is worked by a locomobile of 12 horsepower, and employs 30 laborers, the daily output being 40 to 60 metric tons of peat in the dry state. The working costs are about 3s. 4d. (80 cents) per metric ton of dried peat, the wages of the laborers being about $1 (in Sweden).

In Germany, most of the peat-pressing machines are made by R. Dolberg, in Rostock, and by A. Heinen, in Oldenburg (p. 141). All these machines are much alike in their construction. The peat is dug from the bog with the spade and filled into an elevator, which carries it into the milling machine. Much hand work and many laborers are thus required for these machines, but they are able to handle 1½ to 2 tons of peat per man per day.

Improvements may be made in these European peat factories, especially by replacing the individual locomobiles at each machine by a central power plant and transmitting power to an electric motor for each peat presser. The digging and carrying away of the peat, which is everywhere performed by laborers, ought also to be done by electric power. Costs would then be much reduced where wages are high.

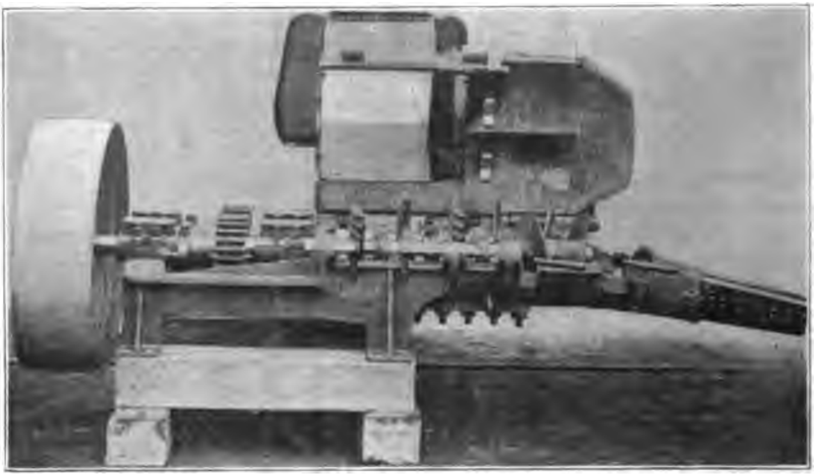
Digging and cutting machines, both for hand and steam working, are used in eastern Germany and in the Netherlands, but only where the bogs are so wet and swampy that the water may not be drained away and cutting by hand in ordinary manner is consequently impossible. Most of these cutting machines are made by Dolberg, in Rostock. They are used floating on prams or standing on rails on the bogs. The peat dug out is then immediately carried to the milling machines, but may also be used as ordinary cut peat. In the Netherlands, one single manufacturer by this method makes in a summer nearly 100,000 metric tons of dried peat, all of which is sold in Amsterdam, the selling price being about 18s. ($4.30) per ton. The Dutch burn peat in place of coal in their stoves, hence the high prices.

In some places, the peat is milled together with water, and the half-liquid mixture is then molded in, forms like bricks. This method is used in the Netherlands and to some extent in Sweden, but has been worked out more particularly in Denmark. In that country, one of the best-planned peat factories in Europe is to be seen at the little railway station Sparkjer, in Jutland. The operations performed there are rather different from those of other places and will prove advantageous everywhere they may be used. The milling machinery is not, as in other peat factories, placed on the bog itself, but on the flat and sandy land immediately at the shore; the peat is carried up to the mill by a locomotive. The mill is driven by a stationary 12-horsepower steam engine and is of very simple construction, consisting only of a rectangular box 13 meters (14.1 yards) in length, in which rotates a roller set with knives that will break up the peat and mix it with water. The roller makes about

60 revolutions per minute. In this manner the peat is got into a semiliquid state; it is then carried on rails by horses to the drying plain, where it is molded into forms. The drying plain is situated on the flat and sandy land surrounding the bog; the same drying plain is thus used three or four times during the summer season.

Sixty-five metric tons per day of dried peat are thus made by 20 laborers, giving an output of more than 3 tons for each man. The costs of production amount to less than 2s. 6d. (60 cents) per metric ton, the wages being about 5s. 6d. ($1.33) a day. In the figures of costs of the peat given here and elsewhere, amortisations are not included, but as these are rather small they will not tend to increase costs substantially. The whole installation at Sparkjer, with exception of the bog, cost about $9,000; as the peat is sold on the place at a price of 7s ($1.75) per ton, it is seen that there will be a good margin of profit.

In the peat factory at Sparkjer, some floating peat mills are also used. The milling machinery, together with a 2-horsepower gasoline motor, is mounted on a pram floating in the turf pit. At these small plants 4 laborers will make 13 tons of dried peat per day. Costs are even smaller than the above, not exceeding 51 cents per metric ton. Throughout Europe, machine-made peat is nowhere produced at so small cost. The inventor of the appliances at Sparkjer is the Danish captain of horse Rahbek.



Anrys' peat milling machine, opened to show construction.

For a long time, much attention has been given to the coking of peat in order to get a substitute for wood charcoal and for coke, the charcoal of peat ranging between these two. Formerly, peat coke was used in several places in Germany and in Austria for metallurgical purposes, and many different methods and various kilns have been proposed and used for the coking, all of which have proved more or less unsuitable for the purpose, uneconomical, and upon the whole unsuccessful, the peat coke being too costly to compete with coke from coal. In Europe, therefore, there was for many years only one factory for peat coking, but in the last two years one or two more have been established. A plant with five kilns, according to the method of Dr. Ziegler, of Berlin, was erected in 1894 in Oldenburg, in the midst of the most extensive peat areas of Germany. In each kiln, 10 to 12 metric tons of peat are coked in twenty-four hours, 3 tons of peat giving on an average 1 ton of coke. The heat in the kilns reaches 600° C. (about 1,100° F.) and the coking is complete. All volatile matter is driven out and the coke burns without flame. The gases are used for the heating of the kilns, and are sufficient for that purpose and for heating in addition the boiler of a steam plant. The coke is sold at a price of 60 marks (60 shillings, or $14 to $15) per metric ton, but as it is almost completely free from sulphur, it is highly useful for metallurgical purposes and thus competes with wood charcoal. It is also much used by braziers and the like. Besides coke and the heating gases, the peat on coking will give tar and tar water, this being actually the case in Oldenburg, where gas, oil, sulphate of ammonium, etc., are sold as secondary products.

Dr. Ziegler has planned in Russia a coking plant for peat on the same principles as that in Oldenburg, but with the object of getting coke for locomotive use. The locomotives in Russia usually are fired with wood and mineral oils, as coal is scarce in that country and the importation is very small. In order to be independent of foreign supply of fuel, the Russian Government is trying to use peat coke for firing the locomotives, and has built a plant on the Ziegler system at Redkino, on the railway between St. Petersburg and Moscow. In view of the purpose for which the coke is intended, the coking is not complete, but the fuel retains much of the bituminous matter and therefore burns with a long and bright flame. The yield of coke from the peat is thus increased, so that the weight obtained is half that of the peat. The success of this plant has proved good, and it is the intention to build several others in various places in Russia.

In western Norway, near Bergen, a peat-coking plant has been built of late on somewhat different principles, the heating being effected by an electric current taken from a waterfall in the neighborhood. Each kiln is loaded with 400 to 500 kilograms (882 to 1,102 pounds) of dried machine-made peat, and the coking takes some three to four hours. The electric current is of 500 amperes with a tension of 40 to 50 volts; the temperature in the kilns is about 300° C. (570° F.). The coke is rather compact and burns with a long and bright flame; it is very well suited for domestic purposes, and sells in Bergen at a price of 15s. ($3.60) per metric ton.

In very recent years, factories have been built in Europe for the briquetting of dried peat; the briquettes are much like those of brown coal (lignite) in appearance and calorific power; they are very solid, and have a fine and polished surface from the strong pressure. The peat is partly dried artificially in the factory, then crumbled, and lastly pressed in open press forms under a very heavy pressure—about 1,500 atmospheres. The press forms are open, as the friction is sufficient to produce the needed resistance. The specific gravity of the peat briquettes exceeds unity, and they have a calorific power about three-fourths that of ordinary coal. At present there are four such plants existing in Europe, viz, two in Germany, one in the Netherlands, and one in Russia, but it is to be supposed that more will be built, as the briquettes of peat, as well as those of lignite, are very clean to handle and thus very well fitted for household use as fuel.

Germany and the Netherlands are the native countries of peat-fuel making. In both these lands peat has been used from very ancient times, as already stated, and it is in Germany that most of the modern methods for its manufacture have been worked out. In fact, especially in Germany, much labor and much money have been spent in various unsuccessful methods of manufacture. In these countries also peat is to-day very commonly used, more especially in the Netherlands. Within recent times Sweden, Denmark, and Russia have widely enlarged their peat production. In Austria, also, peat is much used in factories, especially in glass houses and brick manufactories. In Norway peat is used in the stoves in the western part of the country, where wood is scarce; but though bogs are found almost everywhere, there are no large peat factories, owing to the scanty population of this country, and to the fact that water power is obtainable in most places for industrial uses.

Apart from hand cutting of peat, milling through machines as described is almost the only method used throughout Europe. But as the peat to fill into the machines is dug by hand, many laborers are required, and this circumstance will make peat costly where wages are high, and as these tend to increase everywhere, machinery must be constructed to dig the peat; but with the exception of very low-lying bogs where water stands on the very surface, such appliances are nowhere used as yet.

In northwestern Germany and in the Netherlands, peat is used chiefly as domestic fuel and, as stated above, is sold in Amsterdam at prices absolutely higher than those of coal, peat measured by its thermal effects being more than twice as costly as coal. There is no special construction of the stoves, but in Denmark a special patented device, the so-called "spit stove" of Mr. Reck, is used for peat combustion.

In southern and eastern Germany, but above all in Russia and in Sweden, peat is used principally for industrial purposes, a great many boilers, small and large, being peat-fired. In breweries, distilleries, and under salt pans, peat is used in Germany on a very large scale and is very advantageous for these purposes, the heat being not so intense as when coal is used. Moreover, as peat contains no sulphur, the caldrons and boilers are not subject to so much injury as when coal-fired. It is estimated that they will last three times as long as when coal is used for fuel. Boilers of any size may be heated by peat; for the larger units, step grates are the most suitable; the peat may then be fired even when rather wet, this being of importance in summers when drying is difficult and not thoroughly performed.

Ordinary peat has a thermal effect about half that of coal, the accurate proportion being as 1:1.8. Hence it follows that the transportation of a thermal unit in peat will cost about twice as much as in coal. Establishments based upon the use of peat fuel should therefore generally be placed very near the bogs, this being actually the case in eastern Germany and in Russia. But as this is a very heavy drawback, bogs often lying apart and far from the great lines of transportation, central power plants should be erected in the middle of the large bog areas and power transmitted electrically to places more suitable for the factories. Such power plants have not as yet been established, but it is easy to show that fuel for one horsepower in such a plant, erected in the immediate vicinity of the bog, will cost only one-ninth of a cent per hour.

In an article contributed by W. O. Webber to this magazine for the issue of September, 1898, it is stated that in the best large steam-power plants, only 1 pound of coal is used for one horsepower hour. As 1 pound of ordinary coal is equal to 1.8 pounds of peat, this costing 5 s., or $1.25, per ton, the cost of peat fuel will not exceed one-ninth of a cent per horsepower hour.

Gas from peat is used for heating purposes in several places in Europe, but most extensively in Sweden. In that country it is used for the melting of Martin steel, while in other places it is used in glass houses and the like. The generators used are of very simple construction. In a Swedish magazine, Jernkontorets Annaler, Rich Aakermann has given an exhaustive memoir on the use of gas for Martin steel melting.

The peat used in Sweden for generating gas has the following composition:

	Per cent.
Carbon	60
Hydrogen	6.4
Oxygen	31.7
Nitrogen	1.9

Or, if hygroscopic water and ashes be reckoned:

	Per cent.
Carbon	38.2
Hydrogen	4.1
Oxygen	20.2
Nitrogen	1.2
Sulphur	0
Ash	8.6
Water (hygroscopic)	27.7

The gases have the following composition:

	Per cent of volume.
CO_2	6.9
CO	26
C_2H_4	.5
CH_4	4.4
H	8.5
N	53.7

The quantity of gas obtained from 100 kilograms (220.4 pounds) of peat is about 252 cubic meters (8,900 cubic feet). The sorts of peat here used have an excessive amount of ash and much hygroscopic water. In fact, ordinary peat will not have more than 5 per cent of ash, and when well dried in the air it will not contain more than 20 per cent of water; under such conditions, the gas will be of much better composition.

Heinen's works for building peat milling machines at Varel, Oldenburg, Germany.

It is not known that peat is used anywhere in Europe to produce power gas on any particularly large scale, but the results obtained of late with the Mond gas generators, where power gas is generated from slack coal with 60 per cent of carbon, would tend to show that peat will give as good results.

In reality, there is no great difference between such slack coal with 60 per cent of carbon and good peat, the only difference being the greater contents of water in the peat. But as 2½ tons of water, as steam, are used in the Mond gas generators to 1 ton of slack coal, to regulate the process, the larger amount of water in the peat must not be considered as a drawback, but rather as tending to make the generating of steam superfluous and thus to reduce costs.

In the figures given above, showing the composition of Swedish peat gases, nitrogen is present in rather large amount. This results from unmixed air being used for the combustion in the generators; when it is properly mixed with steam and carbonic oxide, the results obtained will prove better.

It is now well known that gas may be led economically to great distances for power supply and for incandescent lamps. Thus, Mond gas is piped in England from central gas works to the surrounding factories, and in Pennsylvania natural gas is piped for distances exceeding 90 miles. There is no reason why gas from peat should not be used in the same manner.

It is my opinion that where the peat can not be used in factories on the spot, it should not be transported, as costs will be nearly double those for carriage of coal; but power should be transmitted, either in the form of electricity or as peat gas, the former for long distances, the latter for shorter ones.

The use of peat on a larger scale than hitherto will not only prove to give cheap fuel, but the digging out of the bogs will in many cases make the countries more wholesome, and the bottom of the bogs will give a fertile soil, as is seen in the Netherlands.

DUNDEE.

The manufacture of briquetted coal, peat, or lignite, so far as this district is concerned, does not exist. Coal briquettes are consumed, but the quantity used is so small that it is almost inappreciable as an article of commerce. They are retailed at from 16 cents to 24 cents a dozen, according to size.

As this district receives a full and cheap supply of coal from the large mines of the adjoining county of Fife, it would seem that there is no opening for peat and lignite briquetted fuel. Deposits of both peat and lignite no doubt exist in the Highlands, but not to any considerable extent.

JOHN C. HIGGINS, *Consul.*

DUNDEE, *November 9, 1902.*

DUNFERMLINE.

Owing to the cheapness of coal, which is one of the principal industries of this section, the sale of briquettes—tried several years ago in some parts of the district—did not prove a success, and fuel of that description is not now in use here. The only attempt to manufacture briquetted fuel in the consular district was by the Alloa Coal Company at Alloa, which was discontinued, I am informed, owing to the fact that it could not be manufactured and sold at a profit in competition with coal.

Briquetted fuel is manufactured to some extent in the west of Scotland, but the chief centers of the industry are Wales[a] and Northumberland.

Briquette fires last for a long time without requiring attention, but when poked the briquettes crumble to pieces, and they are therefore not suitable for boiler furnaces.

J. N. McCUNN, *Consul.*

DUNFERMLINE, *March 10, 1903.*

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[a] See footnote, p. 127.

GLASGOW.

It is estimated that about 60,000 tons of briquetted fuel are manufactured and used annually in Scotland. Practically the whole of this amount is produced and consumed in this consular district.

The briquettes are made from waste bituminous coal, which in most cases is washed before being used, and their composition is, roughly, 90 per cent coal and 10 per cent pitch.

The cost of manufacture per ton is as follows:

Pitch, at, say, $12.16 per ton	$1.21
Washed small coal, at, say, $1.21 per ton	1.09
Wages, interest, and money invested in wear and tear of plant, per ton	.24
Total	2.54

The average selling price at works is $2.92 per ton.

As to the method of manufacture, the small coal is first ground to about the fineness of sawdust; then the pitch is mixed with it. The mass is then dried and solidified and cut into blocks, usually four pounds in weight and oblong in shape. Plants that have given most satisfaction in Scotland are made by Messrs. Yeadon & Co., Leeds, England.

The average daily capacity of one of these plants is about 100 tons, and to operate it three or four men and as many boys are required. The boys are employed in removing and stacking the blocks.

The briquette plants in Scotland are located at the works of—

Messrs. William Baird & Co., Limited, Cumnock, Ayrshire.
Messrs. The Coltness Iron Company, Limited, Newmains.
Messrs. James Nimmo & Co., Longrigg Colliery, Slamannan.

Almost all the machines used in the manufacture of briquetted fuel have been patented, but in most cases the patents have practically expired.

The heating power of briquettes is about the same as that of bituminous coal.

SAMUEL M. TAYLOR, *Consul.*

GLASGOW, *December 2, 1902.*

CANADA.

PEAT-FUEL INDUSTRY IN CANADA.[a]

Recognizing that a good and cheap substitute for anthracite coal would prove a great boon to the people of many States of the Union, and having learned that the efforts in Canada to produce dense fuel blocks from peat have within the last few months been brought to a successful issue, I have made inquiry with a view to reporting whatever has been definitely accomplished, and I find that practical experiments, which have been perseveringly continued for some years, have now resulted in the economical production of a salable peat fuel, highly satisfactory for domestic purposes.

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[a] Reprinted from Advance Sheets No. 1491, November 10, 1902.

Manufacturing operations on a commercial scale have been reported upon by engineers of high standing, and all agree in the opinion that methods and appliances are now available whereby peat briquettes may be produced, ready for shipment, for a maximum manufacturing cost or $1.50 per ton, and probably for considerably less in plants of large capacity.

There is some difference of opinion as to the length of time a given weight of peat briquettes will burn, as compared with the same weight of anthracite. Theoretically, the heat units in peat being fewer, it may be argued it must burn out faster; but with effective control of drafts, it is surprising how nearly its lasting quality approaches that of hard coal, as more perfect combustion is usually had in the burning of peat under ordinary conditions.

Preeminently to two individuals (Joseph M. Shuttleworth, of Brantford, Ontario, and Alexander Dobson, of Beaverton, Ontario), in association with the Peat Machinery Supply Company, Limited, of Toronto, and the Peat Development Syndicate, Limited, of Brantford, is due the success of this new industry. The machinery in operation at Beaverton is reported by the secretary of the Ontario bureau of mines as "withstanding the test of steady usage, producing sufficient fuel for the town, with some over for shipment."

A word of caution to intending operators may be timely. I notice many references in the public press in regard to the formation of companies proposing to utilize peat beds. Fully $400,000 has in the course of seven or eight years been practically wasted in Canada in futile attempts in this line. It would appear advisable for intending operators to confer with those in Canada, who have the advantage of thorough acquaintance with peat in its practical manipulation, before adopting untried methods or appliances. European practice, I am told, although successful, in many instances environed by special circumstances, notably cheap manual labor, can not be profitably followed on this side of the Atlantic.

Many peat deposits are not suited for practical use. Only bogs of an average depth of 4 feet and upward and of considerable area (at least 100 acres) should be selected, on account of the expense of the plant. The quality of the peat, feasibility of drainage, and accessibility to some means of transportation should also be considered. Mr. E. J. Checkley, of Toronto, who has been intimately connected for years with peat development in Canada, is investigating peat properties in Illinois, Wisconsin, and Minnesota. He reports that the grass peats of Wisconsin appear to carry so great an admixture of alluvial substances as to make the percentage of ash too high to admit of the satisfactory use of the peat for commercial purposes. The moss peats of northern Wisconsin are much superior in quality, although farther removed from large centers affording the best markets.

The Canadian industry has profited by the cooperation existing among the organizations and individuals I have mentioned as interested in peat development, obviating one source of weakness arising out of attempts made by individual patentees, whose achievements usually embrace only one appliance, leaving many important steps wholly unprovided for. Every one of the many links required to complete the chain of apparatus for a complete outfit should be made sure of before investors embark in the enterprise.

EDWIN N. GUNSAULUS, *Consul.*

TORONTO, *October 31, 1902.*

SUPPLEMENTARY.

Since the publication of my report of October last, I have received scores of letters from persons who desired more detailed information as to the methods employed in the manufacture of peat fuel, the kind of machinery in use, etc., showing an unusual degree of interest in the subject.

Soon after making the report mentioned, I visited the plant at Beaverton to see the methods employed in the manufacture of peat fuel. The season was so far advanced when I made my visit (in November) that the field work had been suspended by reason of frost, and I was therefore unable to see this part of the process in active operation. The plant was, however, at work on peat which had been harvested earlier in the season and stacked for winter use. I was informed by Mr. Dobson, the owner of the plant and the inventor of the appliances in use, that all that is necessary for the continuous operation of the plant the year around is to harvest semidry, and stack during the summer, a sufficient supply of peat for the months when harvesting is impossible.

During the past summer, this plant was the center of a great deal of interest to people from many parts of the United States and Canada; and with a view to ascertaining the cost of manufacturing peat fuel, several mechanical experts have been sent, by prospective investors, to make thorough tests of the whole process and of each of the several appliances.

Mr. Dobson informed me that owing to the excessively wet summer, and because of extensive experiments, which were only completed in August, the amount of peat harvested was not sufficient to run the plant through the winter, or it would have been operated continuously. Hereafter, it is intended to keep, if possible, a year's supply ahead.

In my report of October 31, 1902, I cautioned intending operators against adopting untried methods and appliances, and now for their benefit I give the following information gleaned from a report by Mr. James Milne (an engineer of Toronto) which was made for the benefit of interested capitalists.

A suitable bed of good quality of peat, of sufficient area to warrant the erection of a plant and capable of being drained, having been secured, the several operations are the following:

1. Ditching and cleaning the surface of that portion of the bed to be used for digging and drying operations.

2. Track laying.

3. Digging, pulverizing, and spreading the peat over the surface of the bed, where the moisture is rapidly given up in ordinarily dry weather. This is most important. A great amount of money has been expended in trying to prepare peat for the drying plant, but hitherto without much success, as the handling of 80 or 85 per cent of water contained in peat beds is naturally a very serious problem.

At the Beaverton plant this is done by an excavator, or harvester,[a] which digs, pulverizes, and spreads the peat at one operation, only one man and a 10 to 15 horsepower motor being required to handle from 100 to 150 tons in ten hours, when engaged in working on peat containing about 80 per cent of moisture.

The harvester consists of an endless chain with special buckets and cutters, driven by suitable mechanism, which cuts the peat the entire depth of the bog, and elevates it to a conveyer about 8 feet above the bottom of the bog. The machine is so arranged at present that it can cut any depth down to 4 feet, the depth being easily controlled by the raising or lowering of the lower end of the case containing the endless chain with the cutters and buckets. The spreading of the peat on the dry top of the bog is a most important part of the work, as tests show that the moisture can be reduced to about 36½ per cent after several hours' exposure on a good drying day. The whole machine, the harvester and spreader combined, is driven by a 6-horsepower electric motor. The rate of travel is from 3 feet to 3 feet 6 inches per minute, and the width of the cut is 12 inches.

When the frost is out of the ground in the spring the men set to work to dig enough crude peat for firing the drier and boiler during the entire season. One man can dig sufficient peat in one day to keep the drier and boiler going two days. One man is also engaged in wheeling this crude peat to the boiler and drier.

4. Gathering the peat after it has been exposed to the action of the sun and air, 70 tons of water out of each 100 tons of material having

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[a] See page 148.

been evaporated by this drying process. The gathering was done by two men at the time Mr. Milne made his report, but I am informed that now, by means of an electrical peat gatherer, propelled by a 5-horsepower motor, the work of several men is accomplished by one, thus effecting a considerable saving in the cost of finished fuel.

5. Loading on electric dumping car and bringing the peat to the works or stack for winter use. This stage completes the field work. A car, driven by a 5-horsepower electric motor, is run from the level of the bog to a height of about 12 feet, where it is dumped into a large bin. The fuel is conveyed from this bin into the breaker, preparatory to its entering the drier. One man and a 5-horsepower motor can handle sufficient material in ten hours to make 30 tons of fuel. From this stage the process of manufacturing is automatic.

The first five stages are estimated to cost at the rate of 40 cents per ton of finished product.

6. Mechanical drying. The peat is conveyed from the bin or from the stack to the breaker or pulverizer, where it is further disintegrated to facilitate drying, and thence passed to the drier, which consists of two steel tubes 35 feet long, inclosed in a brick arch, these tubes being provided with special devices for causing the rapid evaporation of the moisture remaining in the peat. The drier is fired with crude peat.

From the drier, the peat can be sent directly to the press or be stored in the bin. The last is so constructed that it is possible to arrange the different outlets leading to the press conveyer so that peat containing different percentages of moisture can be mixed on the way to the press.

7. Compressing into hard, dense blocks of finished fuel. As the press[a] is a most important appliance in the manufacture of the fuel (the lack of a suitable one having, I am informed, retarded the enterprise for years), I will quote from Mr. Milne's report:

> The machine runs very nicely indeed. There is no jar, and unless you are intently listening you are unable to tell whether the press is running empty or doing work. Before I saw the machine I had to some extent made up my mind that there might be some point in connection with the revolving die block that might cause serious trouble, but after watching it work several hours at a time, with no one paying any especial attention to it, I am convinced that it can do most efficient work. Not once did I see it miss a block, and all the blocks were the full size and ran about the same weight. There are no water jackets around the dies, and the wear and tear upon them must be small. There are eight dies on each block, and I examined those that had been in operation for some time and the tool marks were still there. The diagram taken at the engine showed that only 13.77 horsepower is required to run the press up to this capacity of 2,651 pounds per hour, including all conveyors in connection with the same.
>
> The daily capacity of the press is 13¼ tons, say 12½ tons, and the total cost of manufacturing less than 90 cents per ton on an output of 12½ tons per day of ten hours. The above includes absolutely all the labor, including superintendence of the plant, but does not include repairs, depreciation and royalty, nor does it include interest on investment.

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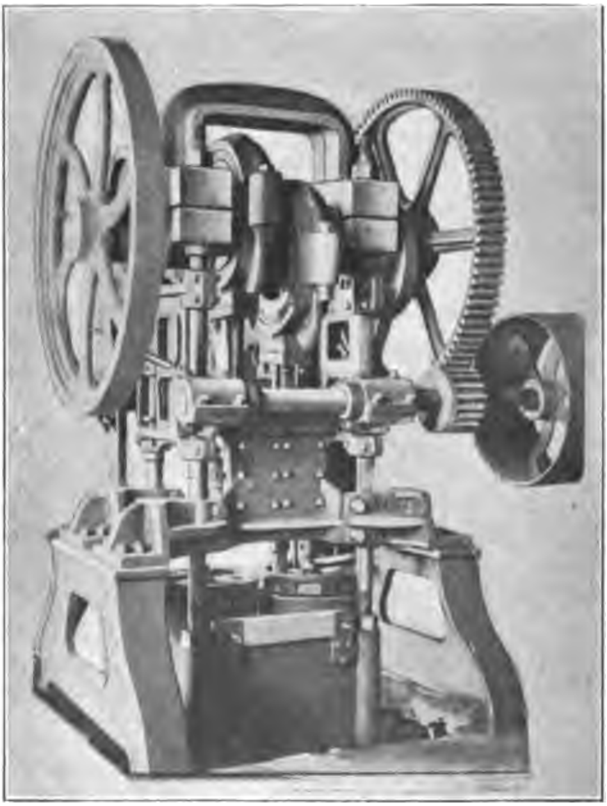
[a] Page 149.

Mr. James Lang, another well-known mechanical engineer, who was sent by capitalists of Toronto to report upon the manufacture of peat fuel, says:

> During the summer of this year (1902) I had occasion to visit the peat factories at Beaverton and Welland, for the purpose of investigating the process and reporting on the cost of manufacturing peat fuel. I entered upon the investigation with grave misgivings as to the practicability of manufacturing upon a paying basis, but the successful working of the Beaverton plant was a revelation to me. The new machinery designed and introduced by Mr. Dobson, of that town, has revolutionized the process and made it possible to place peat fuel upon the Canadian market at a price which will compete successfully with coal. There is, undoubtedly, a great future for peat fuel in this country, and I have no doubt we are on the eve of an immense development of the industry.



Peat briquettes seem to be especially well adapted for use in grates. They ignite readily, a small handful of kindling being all that is required to start the fire. Soon after ignition, the peat gives off a bluish flame, which soon turns to a bright yellow, and increases in volume until the whole grate is filled with flame, rising nearly 2 feet above the fuel and throwing out a steady heat of considerable intensity. This flame continues for about an hour without renewal of fuel, after which there remain the glowing peat coals, the fixed carbon of the peat. The proportion of heat units found in a good sample of peat is, I am told, in the ratio of 5 to 7 of those in anthracite. Many people prefer the peat for light firing, especially in spring and fall, as a quicker fire can be made, and it can be better controlled than a coal fire.

It is proper to say in this connection that the use of peat fuel for heating during the coldest winter months in a northern climate, where heavy firing is required, will not in all respects prove as satisfactory as coal, particularly anthracite, for the reason that it burns out more quickly.

This difficulty can be largely overcome, I am told, by adding a small quantity of coal to the peat when the fire is fixed for the night. It should be remembered that to secure the best results in burning peat for domestic fuel a different method is required from that employed in the burning of coal or wood. Stoves and furnaces must also be especially adapted for the use of the fuel. In this country, however, the furnaces employed for peat are the same as those used for coal or wood, with the exception of the grate in the fire pot, a fine mesh being necessary to prevent the burning peat from falling through.

Another point in connection with peat fuel briquettes is that the manufactured product must at all times be kept dry. Contact with water renders the peat practically valueless as fuel, hence care in transporting and housing it is of the utmost importance.

I am informed that about 500 tons of peat fuel were manufactured at the plant at Beaverton during the last season, nearly all of which was sold for home consumption. A few carloads of this fuel were shipped to Toronto, where it retailed at from $4.50 to $4.75 per ton.

The illustrations in this article are those of Mr. Dobson's patent peat harvester and press. These machines, as well as the other equipment described, are made and sold by the Peat Machinery Supply Company, Limited, of Toronto and Beaverton.

E. N. GUNSAULUS, *Consul.*

TORONTO, *April 1, 1903.*

BRITISH COLUMBIA.

Consul A. E. Smith, of Victoria, reports under date of January 6, 1903:

Briquetted fuel is neither produced nor sold in this district. The supply of natural fuel is so large that there is no demand for the manufactured article. Coal briquettes, however, are brought from Wales to Victoria for the use of the British Navy at Esquimalt. They are made chiefly of coal dust and are in large cakes.

An immense amount of nut and dust bituminous coal is wasted in this district, which in the East would be utilized for fuel. Here it is used for roads, fillings, etc.

Consul L. E. Dudley, of Vancouver, under date of November 13, 1902, says that no briquetted fuel is manufactured or used in that district, so far as he is able to learn. He adds:

At present the supply of coal, bituminous and anthracite, and of wood furnishes sufficient fuel. The material from which briquetted fuel can be made exists here in abundance, fine coal of both kinds, and large fields of peat in the near vicinity of this city which would be immediately available in case of a scarcity of other fuel.

MANITOBA.

Consul W. H. H. Graham writes from Winnipeg, November 15, 1902:

Briquetted fuel is not manufactured or used in this district.

There are extensive fields of lignite coal in the district, convenient to market, of little commercial value in its raw state, that would form an excellent base for the manufacture of such fuel. The high price of fuel of all kinds in the district, and the abundance and cheapness of soft coal, indicate that the manufacture of briquetted fuel would be highly remunerative here.

NOVA SCOTIA.

Consul G. N. West writes from Sydney, November 21, 1902:

No briquetted fuel is now manufactured here.

Previous to 1897, there was manufactured at Port Morien, about 25 miles from Sydney, by a private company, a briquette composed of coal dust, slack coal, and pitch, which was molded into forms about 12 by 6 by 4 inches in size. The greatest output in any one year did not exceed 500 tons. They were disposed of in Nova Scotia and the upper provinces. I am informed by parties here who used a few of them that they gave satisfaction so far as heat and cleanliness were concerned, both for use in open grates and furnaces. At that time, however, bituminous coal was so cheap that the manufacture was not a profitable investment and it was entirely abandoned, the Dominion Coal Company buying up the patents and rights. Since 1897, the Dominion Coal Company has not operated the plant, but has dismantled it, as its entire output of coal has been required to meet contracts.

JAPAN.

NAGASAKI.

There is only one briquetted fuel manufactory in this district, the Rentan Kaisha, at Nagasaki. This plant is under contract to sell its entire product to the Japanese admiralty at 16 yen ($7.97) per ton at the factory. It is capitalized at 1,000,000 yen ($498,000).

The quantity of briquettes manufactured in 1902 was 50,000 tons, in the production of which 92 per cent of smokeless coal dust and 8 per cent of pitch were used.

The cost of manufacture is said to be about 13 yen ($6.47) per ton, coal dust costing 5.33 yen ($2.65) and pitch (Japanese) 70 yen ($34.86) per ton.

Before it is mixed with the pitch, the coal dust is washed thoroughly in fresh water. During the washing a loss of 25 per cent is sustained.

The capacity of the local plant per day of ten hours is 170 tons, and the employees number 50 skilled workmen, at 1.50 yen (75 cents) per day, and 200 coolies, at 50 sen (24.9 cents) French briquetting machines are used.

The company contemplates doubling the capacity of its factory at an early date. To that end another machine has been lately purchased in France. With the new machine, the plant will be in condition to make further contracts.

It is rumored that a very large plant for the manufacture of briquetted fuel is about to be established in this district, in Yamaguchi Ken, near Shimonoseki, but I am as yet unable to learn the details. There is no doubt but that the manufacturing of briquetted fuel will steadily increase in this part of Japan.

Charles B. Harris, *Consul.*

Nagasaki, *January 21, 1903.*

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LIST OF PUBLICATIONS.

On July 1, 1903, the Bureau of Foreign Commerce of the Department of State, which has had charge of the publication and distribution of the CONSULAR REPORTS, was transferred to the Department of Commerce and Labor, in pursuance of provisions in the act of Congress approved February 14, 1903, creating that Department, and consolidated with the Bureau of Statistics, transferred from the Treasury to the new Department. Reports from consular officers on commercial and industrial subjects will hereafter be transmitted through the Department of State to the Department of Commerce and Labor, and the latter will publish and distribute them.

Requests for consular reports should hereafter be made to the Department of Commerce and Labor.

The publications formerly issued by the Bureau of Foreign Commerce will be issued in similar form by the Department of Commerce and Labor. They are as follows:

I.—COMMERCIAL RELATIONS, being the annual reports of consular officers on the commerce, industries, navigation, etc., of their districts.

II.—REVIEW OF WORLD'S COMMERCE, being a summary of the annual reports contained in Commercial Relations.

III.—CONSULAR REPORTS, issued monthly, and containing miscellaneous reports from diplomatic and consular officers.

IV.—DAILY CONSULAR REPORTS, issued daily, except Sundays and legal holidays, for the convenience of the newspaper press, commercial and manufacturing organizations, etc.

V.—EXPORTS DECLARED FOR THE UNITED STATES, issued annually, containing the declared values of exports from the various consular districts to the United States.

VI.—SPECIAL CONSULAR REPORTS, containing series of reports from consular officers on particular subjects, made in pursuance to instructions from the Department.

Following are the special publications issued prior to 1890:

Labor in Europe, 1878, one volume; Labor in Foreign Countries, 1884, three volumes; Commerce of the World and the Share of the United States Therein, 1879; Commerce of the World and the Share of the United States Therein, 1880–81; Declared Exports for the United States, First and Second Quarters, 1883; Declared Exports for the United States, Third and Fourth Quarters, 1883; Cholera in Europe in 1884, 1885; Trade Guilds of Europe, 1885; The Licorice Plant, 1885; Forestry in Europe, 1887; Emigration and Immigration, 1885-86 (a portion of this work was published as CONSULAR REPORTS No. 76, for the month of April, 1887); Rice Pounding in Europe, 1887; Sugar of Milk, 1887; Wool Scouring in Belgium, 1887; Cattle and Dairy Farming in Foreign Countries, 1888 (issued first in one volume, afterwards in two volumes), Technical Education in Europe, 1888; Tariffs of Central America and the British West Indies, 1890.

The editions of all the above-named publications are exhausted, and the Department is therefore unable to supply copies.

Beginning with 1890, reports on special subjects were published in separate form, entitled SPECIAL CONSULAR REPORTS. There are now the following SPECIAL CONSULAR REPORTS:

Vol. 1 (1890).—Cotton Textiles in Foreign Countries, Files in Spanish America, Carpet Manufacture in Foreign Countries, Malt and Beer in Spanish America, and Fruit Culture in Foreign Countries.

Vol. 2 (1890 and 1891).—Refrigerators and Food Preservation in Foreign Countries, European Emigration, Olive Culture in the Alpes Maritimes, and Beet-Sugar Industry and Flax Cultivation in Foreign Countries.

Vol. 3 (1891).—Streets and Highways in Foreign Countries. (New edition, 1897.)

Vol. 4 (1891).—Port Regulations in Foreign Countries.

Vol. 5 (1891).—Canals and Irrigation in Foreign Countries. (New edition, 1898.)

Vol. 6 (1891 and 1892).—Coal and Coal Consumption in Spanish America, Gas in Foreign Countries, and India Rubber.

Vol. 7 (1892).—The Stave Trade in Foreign Countries and Tariffs of Foreign Countries.

Vol. 8 (1892).—Fire and Building Regulations in Foreign Countries.

Vol. 9 (1892 and 1893).—Australian Sheep and Wool and Vagrancy and Public Charities in Foreign Countries.

Vol. 10 (1894).—Lead and Zinc Mining in Foreign Countries and Extension of Markets for American Flour. (New edition, 1897.)

Vol. 11 (1894).—American Lumber in Foreign Markets. (New edition, 1897.)

Vol. 12 (1895).—Highways of Commerce. (New edition, 1899.)

Vol. 13 (1896 and 1897).—Money and Prices in Foreign Countries.

Vol. 14 (1898).—The Drug Trade in Foreign Countries.

Vol. 15 (1898).—Part I. Soap Trade in Foreign Countries; Screws, Nuts, and Bolts in Foreign Countries; Argols in Europe, Rabbits and Rabbit Furs in Europe, and Cultivation of Ramie in Foreign Countries. Part II. Sericulture and Silk Reeling and Cultivation of the English Walnut.

Vol. 16 (1899).—Tariffs of Foreign Countries. Part I. Europe. Part II. America. Part III. Asia, Africa, Australasia, and Polynesia. Supplement (1900). Tariffs of Chile and Nicaragua.

Vol. 17 (1899).—Disposal of Sewage and Garbage in Foreign Countries; Foreign Trade in Coal Tar and By-Products.

Vol. 18 (1900).—Merchant Marine of Foreign Countries.

Vol. 19 (1900).—Paper in Foreign Countries; Uses of Wood Pulp.

Vol. 20 (1900).—Part I. Book Cloth in Foreign Countries, Market for Ready-Made Clothing in Latin America, Foreign Imports of American Tobacco, and Cigar and Cigarette Industry in Latin America. Part II. School Gardens in Europe. Part III. The Stave Trade in Foreign Countries.

Vol. 21 (1900).—Part I. Foreign Markets for American Coal. Part II. Vehicle Industry in Europe. Part III. Trusts and Trade Combinations in Europe.

Vol. 22 (1900 and 1901).—Part I. Acetic Acid in Foreign Countries. Part II. Mineral-Water Industry. Part III. Foreign Trade in Heating and Cooking Stoves.

Vol. 23 (1901).—Part I. Gas and Oil Engines in Foreign Countries. Part II. Silver and Plated Ware in Foreign Countries.

Vol. 24 (1902).—Creameries in Foreign Countries.

Vol. 25 (1902).—Stored Goods as Collateral for Loans.

Vol. 26 (1903).—Briquettes as Fuel in Foreign Countries.

Vol. 27 (1903).—Markets for Agricultural Implements and Vehicles in Foreign Countries.

Of these SPECIAL CONSULAR REPORTS, Australian Sheep and Wool, Carpet Manufacture, Cotton Textiles in Foreign Countries, Files in Spanish America, Fire and Building Regulations, Fruit Culture, Gas in Foreign Countries, Heating and Cooking Stoves, India Rubber, Lead and Zinc Mining, Malt and Beer in Spanish America, Money and Prices, Paper in Foreign Countries, Port Regulations, Refrigerators and Food Preservation; Sericulture, etc.; Silver and Plated Ware; Vagrancy, etc., are exhausted, and no copies can be supplied by the Department.

Of the monthly CONSULAR REPORTS, many numbers are exhausted or so reduced that the Department is unable to accede to requests for copies. Of the publications available for distribution, copies are mailed to applicants without charge.

Persons receiving CONSULAR REPORTS regularly, who change their addresses, should give the old as well as the new address.

VALUES OF FOREIGN COINS AND CURRENCIES.

The following statements show the valuation of foreign coins, as given by the Director of the United States Mint and published by the Secretary of the Treasury, in compliance with the first section of the act of March 3, 1873, viz: "That the value of foreign coins, as expressed in the money of account of the United States, shall be that of the pure metal of such coin of standard value," and that "the value of the standard coins in circulation of the various nations of the world shall be estimated annually by the Director of the Mint, and be proclaimed on the 1st day of January by the Secretary of the Treasury."

In compliance with the foregoing provisions of law, annual statements were issued by the Treasury Department, beginning with that issued on January 1, 1874, and ending with that issued on January 1, 1890. Since that date, in compliance with the act of October 1, 1890, these valuation statements have been issued quarterly, beginning with the statement issued on January 1, 1891.

The fact that the market exchange value of foreign coins differs in many instances from that given by the United States Treasury has been repeatedly called to the attention of the Bureau of Foreign Commerce. An explanation of the basis of the quarterly valuations was asked from the United States Director of the Mint, and under date of February 7, 1898, Mr. R. E. Preston made the following statement:

"When a country has the single gold standard, the value of its standard coins is estimated to be that of the number of grains fine of gold in them, 480 grains being reckoned equivalent to $20.67 in United States gold, and a smaller number of grains in proportion. When a country has the double standard, but keeps its full legal-tender silver coins at par with gold, the coins of both gold and silver are calculated on the basis of the gold value.

"The value of the standard coins of countries with the single silver standard is calculated to be that of the average market value of the pure metal they contained during the three months preceding the date of the proclamation of their value in United States gold by the Secretary of the Treasury. The value of the gold coins of silver-standard countries is calculated at that of the pure gold they contain, just as if they had the single gold standard.

"These valuations are used in estimating the values of all foreign merchandise exported to the United States."

The following statements, running from January 1, 1874, to April 1, 1903, have been prepared to assist in computing the values in American money of the trade, prices, values, wages, etc., of and in foreign countries, as given in consular and other reports. The series of years are given so that computations may be made for each year in the proper money values of such year. In hurried computations, the reductions of foreign currencies into American currency, no matter for how many years, are too often made on the bases of latest valuations. All computations of values, trade, wages, prices, etc., of and in the "fluctuating-currency countries" should be made in the values of their currencies in each year up to and including 1898, and in the quarterly valuations thereafter.

To meet typographical requirements, the quotations for the years 1875–1877, 1879-1882, 1884–1887, 1895, 1897, and 1899 are omitted, these years being selected as showing the least fluctuations when compared with years immediately preceding and following.

To save unnecessary repetition, the estimates of valuations are divided into three classes, viz: (A) countries with fixed currencies, (B) countries with fluctuating currencies, and (C) quarterly valuations of fluctuating currencies.

A.—*Countries with fixed currencies.*

The following official (United States Treasury) valuations of foreign coins do not include "rates of exchange."

Countries.	Standard.	Monetary unit.	Value in U.S. gold.	Coins.
Argentine Republic	Gold and silver	Peso	$0.96,5	Gold—argentine ($4.82,4) and ½ argentine; silver—peso and divisions.
Austria-Hungary[*]	Gold	Crown	.20,3	Gold—20 crowns ($4.05,2) and 10 crowns.
Belgium	Gold and silver	Franc	.19,3	Gold—10 and 20 franc pieces; silver—5 francs.
Brazil	Gold	Milreis	.54,6	Gold—5, 10, and 20 milreis; silver—½, 1, and 2 milreis.
British North America (except Newfoundland).	do	Dollar	1.00	
British Honduras	do	do	1.00	
Chile	do	Peso	.36,5	Gold—escudo ($1.25), doubloon ($3.65), and condor ($7.30); silver—peso and divisions.
Costa Rica	do	Colon	.46,5	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centisimos.
Cuba	Gold and silver	Peso	.92,6	Gold—doubloon ($5.01,7); silver—peso (60 cents).
Denmark	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Ecuador[†]	do	Sucre	.48,7	Gold—10 sucres ($4.8665); silver—sucre and divisions.
Egypt	do	Pound (100 piasters).	4.94,3	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10, and 20 piasters.
Finland	do	Mark	.19,3	Gold—10 and 20 marks ($1.93 and $3.85,9).
France	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany	Gold	Mark	.23,8	Gold—5, 10, and 20 marks.
Great Britain	do	Pound sterling	4.86,6½	Gold—sovereign (pound sterling) and half sovereign.
Greece	Gold and silver	Drachma	.19,3	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti	do	Gourde	.96,5	Silver—gourde.
India[‡]	Gold	Rupee	.32,4	Gold—sovereign ($4.8665); silver—rupee and divisions.
Italy	Gold and silver	Lira	.19,3	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan[§]	Gold	Yen	.49,8	Gold—1, 2, 5, 10, and 20 yen.
Liberia	do	Dollar	1.00	
Netherlands	Gold and silver	Florin	.40,2	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland	Gold	Dollar	1.01,4	Gold—$2 ($2.02,7).
Peru[‖]	do	Sol	.48,7	Gold—libra ($4.8665); silver—sol and divisions.
Portugal	do	Milreis	1.08	Gold—1, 2, 5, and 10 milreis.
Russia[¶]	do	Ruble	.51,5	Gold—imperial ($7.718) and ½ imperial ($3.80); silver—¼, ½, and 1 ruble.
Spain	Gold and silver	Peseta	.19,3	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Switzerland	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey	Gold	Piaster	.04,4	Gold—25, 50, 100, 200, and 500 piasters.
Uruguay	do	Peso	1.03,4	Gold—peso; silver—peso and divisions.
Venezuela	Gold and silver	Bolivar	.19,3	Gold—5, 10, 20, 50, and 100 bolivars; silver—5 bolivars.

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[*] The gold standard went into effect January 1, 1900 (see Commercial Relations, 1899, Vol. II, p. 7). Values are still sometimes expressed in the florin, which is worth 2 crowns.

[†] Gold standard adopted in November, 1900. (See CONSULAR REPORTS No. 225, June, 1899.)

[‡] For an account of the adoption of the gold standard, see CONSULAR REPORTS No. 238, p. 359.

[§] Gold standard adopted October 1, 1897. (See CONSULAR REPORTS No. 201, p. 259.)

[‖] Gold standard adopted October 13, 1900.

[¶] For an account of the adoption of the gold standard, see Review of the World's Commerce, 1896–97, p. 254.

B.—*Countries with fluctuating currencies, 1874–1898.*

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1874.	1878.	1883.	1888.	1889.	1890.
Austria-Hungary*.	Silver	Florin	$0.47,6	$0.45,3	$0.40,1	$0.34,5	$0.33,6	$0.42
Bolivia	do	Dollar until 1880; boliviano thereafter.	.96,5	.96,5	.81,2	.69,9	.68	.85
Central America	do	Peso	.96,5	.91,8	....	.69,9	.68	.85
China	do	Haikwan tael.	1.61	....	....	....	....	....
Colombia	do	Peso	.96,5	.96,5	.81,2	.69,9	.68	.85
Ecuador	do	do	.96,5	.91,8	.81,2	.69,9	.68	.85
Egypt †	Gold	Pound (100 piasters)	....	4.97,4	4.90	4.94,3	....	....
India	Silver	Rupee	.45,8	.43,6	.38,6	.32,2	.32,3	.40,4
Japan	Gold	Yen	.99,7	.99,7	....	.99,7	.99,7	.99,7
	Silver		....	....	.87,6	.75,3	.73,4	.91,7
Mexico	do	Dollar	1.04,75	.99,8	.88,2	.75,9	.73,9	.92,3
Netherlands‡	Gold and silver.	Florin	.40,5	.38,5	....	....	....	....
Peru	Silver	Sol	.92,5	.91,8	.81,2	.69,9	.68	.85
Russia	do	Ruble	.77,17	.73,4	.65	.55,9	.54,4	.68
Tripoli	do	Mahbub of 20 piasters.	.87,09	.82,9	.73,3	.63	.61,4	.76,7

Countries.	Standard.	Monetary unit.	Value in terms of the United States gold dollar on January 1—					
			1891.	1892.	1893.	1894.	1896.	1898.
Austria-Hungary*.	Silver	Florin	$0.38,1	$0.34,1	....	....	....	....
Bolivia	do	Boliviano	.77,1	.69,1	$0.61,3	$0.51,6	$0.49,1	$0.42,4
Central America	do	Peso	.77,1	.69,1	.61,3	.51,6	.49,1	.41,4
Colombia	do	do	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
Ecuador	do	do	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
India	do	Rupee	.36,6	.32,8	.29,2	.24,5	.23,3	.20,1
Japan§	do	Yen	.83,1	.74,5	.66,1	.55,6	.52,9	....
Mexico	do	Dollar	.83,7	.75	.66,6	.56	.53,3	.46
Peru	do	Sol	.77,1	.69,1	.61,3	.51,6	.49,1	.42,4
Russia§	do	Ruble	.61,7	.55,3	.49,1	.41,3	.39,3	....
Tripoli	do	Mahbub of 20 piasters.	.69,5	.62,3	.55,3	.46,5	.44,3	....

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* See footnote to Austria-Hungary under Table A.

† The Egyptian pound became fixed in value at $4.94,3 in 1887.

‡ The Netherlands florin fluctuated up to the year 1880, when it became fixed at 40.2 cents.

§ See footnote, table of fixed currencies.

C.—*Quarterly valuations of fluctuating currencies.*

Countries.	Monetary unit.	1900.				1901.			
		Jan. 1.	April 1.	July 1.	Oct. 1.	Jan. 1.	April 1.	July 1.	Oct. 1.
Bolivia	Silver boliviano.	$0.42,7	$0.43,6	$0.43,8	$0.45,1	$0.46,8	$0.45,1	$0.43,6	$0.42,8
Central America.	Silver peso	.42,7	.43,6	.43,8	.45,1	.46,5	.45,1	.43,6	.42,8
China	Amoy tael	.69,1	.70,5	.70,9	.72,9	.75,7	.72,9	.70,5	.69,1
	Canton tael	.68,9	.70,3	.70,7	.72,7	.75,5	.72,7	.70,3	.68,9
	Chefoo tael	.66,1	.67,4	.67,8	.69,7	.72,4	.69,7	.67,4	.66,1
	Chinkiang tael	.67,5	.68,8	.69,3	.71,2	.74	.71,2	.68,8	.67,5
	Fuchau tael	.64	.65,2	.65,6	.67,4	.70,1	.67,5	.65,2	.64
	Haikwan tael	.70,3	.71,7	.72,1	.74,2	.77,1	.74,2	.71,7	.70,4
	Hankau tael	.64,7	.65,9	.66,3	.68,2	.70,9	.68,2	.65,9	.64,7
	Hongkong tael	(*)	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	Ningpo tael	.66,5	.67,7	.68,2	.70,1	.72,8	.70,1	.67,8	.66,5
	Niuchwang tael.	.64,8	.66,1	.66,5	.68,4	.71	.68,4	.66,1	.64,8
	Shanghai tael	.63,1	.64,4	.64,8	.66,6	.69,2	.66,6	.64,4	.63,2
	Swatow tael	.63,9	.65,1	.65,5	.67,4	.70	.67,4	.65,1	.63,9
	Takao tael	.69,6	.70,9	.71,4	.73,4	.76,2	.73,4	.70,9	.69,6
	Tientsin tael	.67	.68,3	.68,7	.70,7	.73,4	.70,7	.68,3	.67
Colombia	Silver peso	.42,7	.43,6	.43,8	.45,1	.46,8	.45,1	.43,6	.42,8
Ecuador †	do	....	....	....	....	....	....	....	....
India	Silver rupee‡	.20,3	.20,7	.20,8	....	....	....	....	....
Mexico	Silver dollar	.46,4	.47,3	.47,6	.49	.50,9	.49	.49	.46,4
Persia	Silver kran	.07,9	.08	.08,1	.08,3	.08,6	.08,3	.08,3	.07,9
Peru †	Silver sol	.42,7	.43,6	.43,8	.48,7	....	....	....	....

Countries.	Monetary unit.	1902.				1903.		
		Jan. 1.	April 1.	July 1.	Oct. 1.	Jan. 1.	April 1.	July 1.
Bolivia	Silver boliviano.	$0.41,3	$0.40,3	$0.38,2	$0.38,4	$0.36,1	$0.35,2	$0.38,4
Central America	Silver peso	.41,3	.40,3	.38,2	.38,4	.36,1	.35,2	.38,4
China	Amoy tael	.66,9	.65,1	.61,8	.62	.58,4	.57	.62,2
	Canton tael	.66,7	.64,9	.61,7	.61,9	.58,2	.56,8	.62
	Chefoo tael	.63,9	.62,3	.59,1	.59,3	.55,8	.54,5	.59,5
	Chinkiang tael	.65,3	.63,6	.60,4	.60,6	.57	.55,7	.60,7
	Fuchau tael	.61,8	.60,2	.57,2	.57,4	.54	.52,7	.57,5
	Haikwan tael	.68	.66,3	.62,9	.63,1	.59,4	.58	.63,3
	Hankau tael	.62,6	.60,9	.57,9	.58	.54,6	.53,3	.58,2
	Hongkong tael	(*)	(*)	(*)	(*)	(*)	(*)	(*)
	Ningpo tael	.64,3	.62,6	.59,5	.59,6	.56,1	.54,8	.58,3
	Niuchwang tael.	.62,7	.61,1	.58	.58,2	.53,3	.53,4	.59,8
	Shanghai tael	.61,1	.59,5	.56,5	.56,7	.53,9	.52	.56,8
	Swatow tael	.61,8	.60,2	.57,1	.57,3	.58,8	.52,6	.57,5
	Takao tael	.67,3	.65,5	.62,2	.62,4	.56,6	.57,3	.62,6
	Tientsin tael	.64,8	.63,1	.59,9	.60,1	.60,1	.55,2	.60,3
Colombia	Silver peso	.41,3	.40,3	.38,2	.38,4	.36,1	.35,2	.38,4
Mexico	Silver dollar	.44,9	.43,7	.41,5	.41,7	.39,2	.38,3	.41,8
Persia	Silver kran	.07,6	.07,4	.07	.07,1	.06,6	.06,5	.07,1

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* The "British dollar" has the same legal value as the Mexican dollar in Hongkong, the Straits Settlements, and Labuan.

† See footnote, table of fixed currencies.

‡ The sovereign is the standard coin of India, but the rupee is the money of account. See also table of fixed currencies.

FOREIGN WEIGHTS AND MEASURES.

The following table embraces only such weights and measures as are given from time to time in CONSULAR REPORTS and in Commercial Relations:

Foreign weights and measures, with American equivalents.

Denominations.	Where used.	American equivalents.
Almude	Portugal	4.422 gallons.
Ardeb	Egypt	7.6907 bushels.
Are	Metric	0.02471 acre.
Arobe	Paraguay	25 pounds.
Arratel or libra	Portugal	1.011 pounds.
Arroba (dry)	Argentine Republic	25.3175 pounds.
Do	Brazil	32.38 pounds.
Do	Cuba	25.3664 pounds.
Do	Portugal	32.38 pounds.
Do	Spain	25.36 pounds.
Do	Venezuela	25.4024 pounds.
Arroba (liquid)	Cuba, Spain, and Venezuela	4.263 gallons.
Arshine	Russia	28 inches.
Arshine (square)	do	5.44 square feet.
Artel	Morocco	1.12 pounds.
Baril	Argentine Republic and Mexico	20.0787 gallons.
Barrel	Malta (customs)	11.4 gallons.
Do	Spain (raisins)	100 pounds.
Batman or tabriz	Persia	6.49 pounds.
Berkovets	Russia	361.12 pounds.
Bongkal	India	832 grains.
Bouw	Sumatra	7,096.5 square meters.
Bu	Japan	0.1 inch.
Butt (wine)	Spain	140 gallons.
Caffiso	Malta	5.4 gallons.
Candy	India (Bombay)	529 pounds.
Do	India (Madras)	500 pounds.
Cantar	Morocco	113 pounds.
Do	Syria (Damascus)	575 pounds.
Do	Turkey	124.7036 pounds.
Cantaro (cantar)	Malta	175 pounds.
Carga	Mexico and Salvador	300 pounds.
Catty	China	1.333⅓ (1⅓) pounds.
Do*	Japan	1.31 pounds.
Do	Java, Siam, and Malacca	1.35 pounds.
Do	Sumatra	2.12 pounds.
Centaro	Central America	4.2631 gallons.
Centner	Bremen and Brunswick	117.5 pounds.
Do	Darmstadt	110.24 pounds.
Do	Denmark and Norway	110.11 pounds.
Do	Nuremberg	112.43 pounds.
Do	Prussia	113.44 pounds.
Do	Sweden	93.7 pounds.
Do	Vienna	123.5 pounds.
Do	Zollverein	110.24 pounds.
Do	Double or metric	220.46 pounds.
Chetvert	Russia	5.7748 bushels.
Chih	China	14 inches.

*More frequently called "kin." Among merchants in the treaty ports it equals 1.33⅓ pounds avoirdupois.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Coyan	Sarawak	3,098 pounds.
Do	Siam (Koyan)	2,667 pounds.
Cuadra	Argentine Republic	4.2 acres.
Do	Paraguay	78.9 yards.
Do	Paraguay (square)	8.077 square feet.
Do	Uruguay	Nearly 2 acres.
Cubic meter	Metric	35.3 cubic feet.
Cwt. (hundredweight)	British	112 pounds.
Dessiatine	Russia	2.6997 acres.
Do	Spain	1.599 bushels.
Drachme	Greece	Half ounce.
Egyptian weights and measures	(*See* CONSULAR REPORTS No. 144.)	
Fanega (dry)	Central America	1.5745 bushels.
Do	Chile	2.575 bushels.
Do	Cuba	1.599 bushels.
Do	Mexico	1.54728 bushels.
Do	Morocco	Strike fanega, 70 pounds; full fanega, 118 pounds.
Do	Uruguay (double)	7.776 bushels.
Do	Uruguay (single)	3.888 bushels.
Do	Venezuela	1.599 bushels.
Fanega (liquid)	Spain	16 gallons.
Feddan	Egypt	1.03 acres.
Frail (raisins)	Spain	50 pounds.
Frasco	Argentine Republic	2.5096 quarts.
Do	Mexico	2.5 quarts.
Frasila	Zanzibar	35 pounds.
Fuder	Luxemburg	264.17 gallons.
Funt	Russia	0.9028 pound.
Garnice	Russian Poland	0.88 gallon.
Gram	Metric	15.432 grains.
Hectare	do	2.471 acres.
Hectoliter:		
Dry	do	2.838 bushels.
Liquid	do	26.417 gallons.
Joch	Austria-Hungary	1.422 acres.
Ken	Japan	6 feet.
Kilogram (kilo)	Metric	2.2046 pounds.
Kilometer	do	0.621376 mile.
Klafter	Russia	216 cubic feet.
Koku	Japan	4.9629 bushels.
Korree	Russia	3.5 bushels.
Kwan	Japan	8.28 pounds.
Last	Belgium and Holland	85.134 bushels.
Do	England (dry malt)	82.52 bushels.
Do	Germany	2 metric tons (4,480 pounds).
Do	Prussia	112.29 bushels.
Do	Russian Poland	11⅜ bushels.
Do	Spain (salt)	4,760 pounds.
League (land)	Paraguay	4,633 acres.
Li	China	2,115 feet.
Libra (pound)	Argentine Republic	1.0127 pounds.
Do	Central America	1.043 pounds.
Do	Chile	1.014 pounds.
Do	Cuba	1.0161 pounds.
Do	Mexico	1.01465 pounds.
Do	Peru	1.0143 pounds.
Do	Portugal	1.011 pounds.
Do	Spain	1.0144 pounds.
Do	Uruguay	1.0143 pounds.
Do	Venezuela	1.0161 pounds.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Liter	Metric	1.0567 quarts.
Livre (pound)	Greece	1.1 pounds.
Do	Guiana	1.0791 pounds.
Load	England (timber)	Square, 50 cubic feet; unhewn, 40 cubic feet; inch planks, 600 superficial feet.
Manzana	Costa Rica	1¾ acres.
Do	Nicaragua and Salvador	1.727 acres.
Marc	Bolivia	0.507 pound.
Maund	India	82 2/7 pounds.
Meter	Metric	39.37 inches.
Mil	Denmark	4.68 miles.
Do	Denmark (geographical)	4.61 miles.
Milla	Nicaragua and Honduras	1.1493 miles.
Morgen	Prussia	0.63 acre.
Oke	Egypt	2.7225 pounds.
Do	Greece	2.84 pounds.
Do	Hungary	3.0817 pounds.
Do	Turkey	2.82838 pounds.
Do	Hungary and Wallachia	2.5 pints.
Pic	Egypt	21¼ inches.
Picul	Borneo and Celebes	135.64 pounds.
Do	China, Japan, and Sumatra	133⅓ pounds.
Do	Java	135.1 pounds.
Do	Philippine Islands	137.9 pounds.
Pie	Argentine Republic	0.9478 foot.
Do	Spain	0.91407 foot.
Pik	Turkey	27.9 inches.
Pood	Russia	36.112 pounds.
Pund (pound)	Denmark and Sweden	1.102 pounds.
Quarter	Great Britain	8.252 bushels.
Do	London (coal)	36 bushels.
Quintal	Argentine Republic	101.42 pounds.
Do	Brazil	130.06 pounds.
Do	Castile,* Chile, Mexico, and Peru	101.41 pounds.
Do	Greece	123.2 pounds.
Do	Newfoundland (fish)	112 pounds.
Do	Paraguay	100 pounds.
Do	Syria	125 pounds.
Do	Metric	220.46 pounds.
Rottle	Palestine	6 pounds.
Do	Syria	5¾ pounds.
Sagene	Russia	7 feet.
Salm	Malta	490 pounds.
Se	Japan	0.02451 acres.
Seer	India	1 pound 13 ounces.
Shaku	Japan	11.9305 inches.
Sho	do	1.6 quarts.
Standard (St. Petersburg)	Lumber measure	165 cubic feet.
Stone	British	14 pounds.
Suerte	Uruguay	2,700 cuadras (see cuadra).
Sun	Japan	1.193 inches.
Tael	Cochin China	590.75 grains (troy).
Tan	Japan	0.25 acre.
To	do	2 pecks.
Ton	Space measure	40 cubic feet.
Tonde (cereals)	Denmark	3.94783 bushels.
Tondeland	do	1.36 acres.

*Although the metric weights are used officially in Spain, the Castile quintal is employed in commerce in the Peninsula and colonies, save in Catalonia; the Catalan quintal equals 91.71 pounds.

Foreign weights and measures, with American equivalents—Continued.

Denominations.	Where used.	American equivalents.
Tsubo	Japan	6 feet square.
Tsun	China	1.41 inches.
Tunna	Sweden	4.5 bushels.
Tunnland	Sweden	1.22 acres.
Vara	Argentine Republic	34.1208 inches.
Do	Central America	32.87 inches.
Do	Chile and Peru	33.367 inches.
Do	Cuba	33.384 inches.
Do	Curaçao	33.375 inches.
Do	Mexico	33 inches.
Do	Paraguay	34 inches.
Do	Spain	0.914117 yard.
Do	Venezuela	33.384 inches.
Vedro	Russia	2.707 gallons.
Vergees	Isle of Jersey	71.1 square rods.
Verst	Russia	0.663 mile.
Vlocka	Russian Poland	41.98 acres.

METRIC WEIGHTS AND MEASURES.

Metric weights.

Milligram ($\frac{1}{1000}$ gram) equals 0.0154 grain.
Centigram ($\frac{1}{100}$ gram) equals 0.1543 grain.
Decigram ($\frac{1}{10}$ gram) equals 1.5432 grains.
Gram equals 15.432 grains.
Decagram (10 grams) equals 0.3527 ounce.
Hectogram (100 grams) equals 3.5274 ounces.
Kilogram (1,000 grams) equals 2.2046 pounds.
Myriagram (10,000 grams) equals 22.046 pounds.
Quintal (100,000 grams) equals 220.46 pounds.
Millier or tonnea—ton (1,000,000 grams) equals 2,204.6 pounds.

Metric dry measures.

Milliliter ($\frac{1}{1000}$ liter) equals 0.061 cubic inch.
Centiliter ($\frac{1}{100}$ liter) equals 0.6102 cubic inch.
Deciliter ($\frac{1}{10}$ liter) equals 6.1022 cubic inches.
Liter equals 0.908 quart.
Decaliter (10 liters) equals 9.08 quarts.
Hectoliter (100 liters) equals 2.838 bushels.
Kiloliter (1,000 liters) equals 1.308 cubic yards.

Metric liquid measures.

Milliliter ($\frac{1}{1000}$ liter) equals 0.0388 fluid ounce.
Centiliter ($\frac{1}{100}$ liter) equals 0.338 fluid ounce.
Deciliter ($\frac{1}{10}$ liter) equals 0.845 gill.
Liter equals 1.0567 quarts.
Decaliter (10 liters) equals 2.6418 gallons.
Hectoliter (100 liters) equals 26.417 gallons.
Kiloliter (1,000 liters) equals 264.18 gallons.

Metric measures of length.

Millimeter ($\frac{1}{1000}$ meter) equals 0.0394 inch.
Centimeter ($\frac{1}{100}$ meter) equals 0.3937 inch.
Decimeter ($\frac{1}{10}$ meter) equals 3.937 inches.

Meter equals 39.37 inches.
Decameter (10 meters) equals 393.7 inches.
Hectometer (100 meters) equals 328 feet 1 inch.
Kilometer (1,000 meters) equals 0.62137 mile (3,280 feet 10 inches).
Myriameter (10,000 meters) equals 6.2137 miles.

Metric surface measures.

Centare (1 square meter) equals 1,550 square inches.
Are (100 square meters) equals 119.6 square yards.
Hectare (10,000 square meters) equals 2.471 acres.

AGRICULTURAL IMPLEMENTS AND VEHICLES IN FOREIGN COUNTRIES.

DEPARTMENT CIRCULAR.

Department of State,
Washington, April 17, 1903.

To the Consular Officers of the United States at Certain Places:

Gentlemen: The Department has been requested by an association of agricultural implement and vehicle manufacturers to procure certain information as to the conditions of the trade in these lines in foreign countries, and you are requested to report in regard thereto. It is desired that your report shall cover the following questions:

1. Is the cost of hand labor sufficiently great to justify the use of labor-saving machinery by the agricultural and manufacturing interests in your respective districts?

2. Are the roads and draft animals suitable for the use of American styles of vehicles for pleasure and freight?

3. Are modern agricultural implements used in preparing the soil, sowing or planting the seed, cultivating during growth, and harvesting or gathering the crops? If so, to what extent and where are these implements manufactured?

4. Are American agricultural implements, vehicles, and wagons sold in your district? If so, are they popular and can the trade be increased? If not, why?

5. Please suggest the most effective means of introducing or increasing the trade in these articles.

6. Name some of the leading houses who would be most likely to be interested in promoting this business.

7. Give the tariff rates imposed on these articles by the respective countries in which you are stationed.

A list of the articles manufactured by the association desiring the data is annexed, in order that you may without going too much into detail designate those that would sell most readily in your consular district.

It is desired that this matter receive prompt attention, as the information will be used at the next annual meeting of the association, which occurs in October, 1903.

The answers to the above will be printed in the CONSULAR REPORTS.

I am, gentlemen, your obedient servant,

HERBERT H. D. PEIRCE,
Third Assistant Secretary.

LIST OF ARTICLES MANUFACTURED BY THE ASSOCIATION.

Agricultural implements.
Automobiles.
Axles, wagon and carriage.
Binder twine.
Bobsleds.
Buggies.
Barn-door hangers.
Baling presses.
Boiler fronts.
Boiler castings.
Binders.
Brass goods.
Binder sickles.
Binder sections.
Bean harvesters.
Binder guard and guard plates.
Binders, corn.
Binders, grain.
Belting, leather.
Cultivators.
Corn planters.
Corn huskers.
Cornshellers.
Carriages.
Corn cleaners.
Cutters, stock.
Cutters, band.
Corn shredders.
Castings, malleable.
Castings, gray-iron.
Carts.
Cultivator teeth.
Corn harvesters.
Cordage.
Cornshellers, hand.
Clover hullers.
Cutters, fodder
Dump carts.
Drills, press.
Drills, grain.
Drills, corn.
Drays.
Drills, fertilizer.
Distributer, manure, lime, and fertilizer.
Delivery vans.
Drills, seed.
Evaporators.
Engines.
Engines, thrashing.
Engines, traction.
Engine tenders.
Feed cutters.
Feed cookers.
Fencing wire.
Farm trucks.
Fencing, woven-wire.
Foundry work,
Self-feeder for thrashing machines.
Fencing, wrought-iron.
Furnaces.
Gasoline engines and pumps.
Gas-power plants.
Grain sieves.
Grain separators.
Harrows.
Horsepowers.
Hay loaders.
Hayrakes.
Hay tools.
Harrows, disk.
Hardware and carriage specialties.
Harness.
Hayracks.
Hay carriers.
Harrows, spring.
Horse hoes.
Harrows, pulverizing.
Harrows, spade.
Implements, farm.
Knives, mower.
Knives, band-cutter.
Link belting, detachable.
Listers.
Lawn swings.
Locomotives.
Machinery, harvesting.
Machines, road.
Mills, grinding.
Mills, steel.
Machinery, special mill and elevator.
Machinery, elevator.
Mower sections.
Mowers.
Machinery, power-transmitting.
Machinery, flour-mill.
Machinery, cereal-mill.
Mill supplies.
Mill machinery.
Mills, saw.
Machinery, thrashing.
Machinery, wire.
Machines, fence.
Mowers (lawn) and grass catchers.
Mills, cane.
Mills, cider.
Manure spreaders.
Machinery, grain-seeding.
Machinery, road.
Mills, fanning.
Machinery, grain-cleaning.
Machinery, hydraulic.
Machinery, ensilage-cutting.

Machines, brick.
Mills, corn and cob.
Mowers, lawn and pony.
Machinery, refrigerator.
Mills, grist (hand).
Mills, iron and brass hand.
Machines, small thrashing.
Plow blades.
Pumps, wood.
Pumps, iron.
Phaetons.
Plows, wheel and walking.
Plows, gang and sulky.
Pumps, force.
Plows, chilled.
Pump supplies.
Plumbing supplies.
Planters, corn (hand).
Potato diggers.
Potato sorters.
Potato cutters.
Pumps, spray.
Potato machinery.
Plows, shovel.
Plows, grading.
Power punches.
Power shears.
Rock crushers.
Rollers.
Road graders.
Reapers.
Scrapers, wheels.
Scales.
Surreys.
Shoveling boards.
Seeders, broadcast.
Silos.
Silos fixtures.
Shaft couplings and hardware specialties.
Store ladders.
Shredders, fodder.
Scrapers.
Shovels.
Spades.
Scoops.
Springs, wagon and carriage.
Sickles.
Truck rollers.
Trucks, log.
Trucks, gasoline-engine.
Tanks, steel.
Trucks, warehouse.
Transplanters.
Umbrellas, rain, sun, and wagon.
Vehicles.
Wagons, farm.
Windmills.
Windmill towers.
Wagons, spring.
Wagons, freight.
Windmill pumps.
Windmill tanks.
Wheels, metal.
Wagons, road.
Wheels, road.
Wagons, bike.
Wagons, dump.
Wind stackers.
Wagons, mountain.
Wagon end gates.
Windmill regulators.
Wagons, delivery.
Wagons, express.
Wheelbarrows.
Wagon gears, platform springs.
Weeders.
Well-drilling machines and tools.
Wagons, lumber.
Wheels, carriage.
Wheel hoes.

INTRODUCTORY STATISTICS.

I. INDUSTRIAL STATISTICS OF THE UNITED STATES.

The following tables are taken from the publications of the Bureau of Statistics, Department of Commerce and Labor:

The following table (from the census returns) presents what may be called a bird's-eye view of the progress of manufacturing and mechanical industries, as revealed by the decennial censuses from 1850 to 1900, inclusive, representing the development of the latter half of the nineteenth century:

Comparative summary, 1850 to 1900, with per cent of increase.

Description.	1900.*	1890.	1880.	1870.
Number of establishments	512,339	355,415	253,852	252,148
Capital	$9,835,086,909	$6,525,156,486	$2,790,272,606	$2,118,208,769
Salaried officials, clerks, etc..number	397,174	†461,009	(‡)	(‡)
Salaries	$404,230,274	†$391,988,208	(‡)	(‡)
Wage-earners......average number	5,316,802	4,251,613	2,732,595	2,053,996
Total wages	$2,328,691,254	$1,891,228,321	$947,953,795	$775,584,343
Men, 16 years and over	4,116,610	3,327,042	2,019,035	1,615,598
Wages	$2,021,349,508	$1,659,234,483	(‡)	(‡)
Women, 16 years and over	1,031,609	803,686	531,639	323,770
Wages	$281,680,054	$215,367,976	(‡)	(‡)
Children, under 16 years	168,583	120,885	181,921	114.628
Wages	$25,661,692	$16,625,862	(‡)	(‡)
Miscellaneous expenses	$1,028,035,611	$631,225,035	(‖)	(‖)
Cost of materials used	$7,348,144,755	$5,162,044,076	$3,396,823,549	$2,488,427,242
Value of products, including custom work and repairing	$13,014,287,498	$9,372,437,283	$5,369,579,191	$4,232,325,442

Description.	1860.	1850.	Increase, 1890 to 1900.
			Per cent.
Number of establishments	140,433	123,025	44.2
Capital	$1,009,855,715	$533,245,351	50.7
Salaried officials, clerks, etc......number	(‡)	(‡)	§13.8
Salaries	(‡)	(‡)	3.1
Wage-earners......average number	1,311,246	957,059	25.1
Total wages	$378,878,966	$236,755,464	23.1
Men, 16 years and over	1,040,349	731,137	23.7
Wages	(‡)	(‡)	21.8
Women, 16 years and over	270,897	225,922	28.4
Wages	(‡)	(‡)	30.8
Children, under 16 years	(‡)	(‡)	39.5
Wages	(‡)	(‡)	54.3
Miscellaneous expenses	(‖)	(‖)	62.9
Cost of materials used	$1,031,605,092	$555,123,822	42.3
Value of products, including custom and repairing	$1,885,861,676	$1,019,106,616	38.9

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* Includes, for comparative purposes, 85 governmental establishments in the District of Columbia having products valued at $9,887,355, the statistics of such establishments for 1890 not being separable.

† Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table.

‡ Not reported separately. § Decrease. ‖ Not reported.

AGRICULTURAL IMPLEMENTS.

Comparative summary of the manufactures, 1850 to 1900, inclusive (taken from the United States Census reports).

Description.	Census of— 1900.	1890.	1880.	1870.
Number of establishments	715	910	1,843	2,076
Capital	$157,707,951	$145,313,997	$62,109,668	$34,834,600
Salaried officials, clerks, etc ... number	10,046	†3,717	(‡)	(‡)
Salaries	$8,363,210	†$3,704,667	(‡)	(‡)
Wage-earners ... average number	46,582	38,827	39,580	25,249
Total wages	$22,450,880	$18,107,094	$15,359,610	$12,151,504
Men, 16 years and over	46,174	38,327	38,813	24,634
Wages	$22,358,158	$17,998,650	(‡)	(‡)
Women, 16 years and over	214	288	73	12
Wages	$66,042	$75,553	(‡)	(‡)
Children, under 16 years	194	212	1,194	603
Wages	$26,680	$32,891	(‡)	(‡)
Miscellaneous expenses	$11,394,656	$11,129,548	(‖)	(‖)
Cost of materials used	$43,944,628	$31,603,265	$31,531,170	$21,473,925
Value of products, including custom work and repairing	$101,207,428	$81,271,651	$68,640,486	$52,066,875

Description.	Census of— 1860.	1850.	Increase. 1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
			Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
Number of establishment	2,116	1,333	21.4	53.2	*6.4	*1.9	58.7
Capital	$13,866,389	$3,564,202	8.5	134	78.3	151.2	289
Salaried officials, clerks, etc., number	(‡)	(‡)	170.3	....	....	....	....
Salaries	(‡)	(‡)	125.7	....	....	....	....
Wage-earners ... average number	17,093	7,220	20	*1.9	56.8	47.7	136.7
Total wages	$5,925,177	$2,167,868	24	17.9	26.4	105.1	173.3
Men, 16 years and over	17,086	7,211	20.5	(§)	55.5	44.2	136.9
Wages	(‡)	(‡)	24.2	....	....	....	....
Women, 16 years and over	7	9	*25.7	294.5	508.3	71.4	*22.2
Wages	(‡)	(‡)	*12.6	....	....	....	....
Children, under 16 years	(‡)	(‡)	*8.5	*82.2	98	....	....
Wages	(‡)	(‡)	*18.9	....	....	....	....
Miscellaneous expenses	( )	(‖)	2.4	....	....	....	....
Cost of materials used	$6,993,162	$2,445,765	39.1	.2	46.8	207.1	185.9
Value of products, including custom work and repairing	$20,831,904	$6,842,611	24.4	18.4	31.8	149.9	204.4

* Decrease.

† Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table.

‡ Not reported separately.

§ Less than one-tenth of 1 per cent.

‖ Not reported.

Statement showing the exports of agricultural machines and implements from the United States to the several countries of the world, 1892–1902.

MOWERS AND REAPERS AND PARTS OF.

Country.	1892.	1894.	1896.	1898.	1900.	1901.	1902.
Austria-Hungary	$36,039	......	$33,281	$28,132	$59,785	$54,221	$24,383
Belgium	59,638	$3,958	23,329	119,170	264,814	212,349	70,516
Denmark	66,975	122,288	137,829	184,590	368,413	159,375	122,003
France	345,086	220,125	360,577	1,146,551	2,652,795	1,459,807	1,148,823
Germany	222,261	386,096	480,773	1,100,210	2,529,422	1,660,946	1,153,933
Gibraltar	......	......	......	......	54	......	......
Greece	......	......	......	......	......	......	200
Italy	12,578	31,326	17,708	39,829	80,376	108,343	147,012
Netherlands	16,687	15,186	66,155	99,987	291,871	593,920	257,620
Portugal	......	1,300	800	2,900	1,028	3,762	3,449
Roumania	22,304	78,592	18,603	77,168	1,800	6,638	26,373
Russia on Baltic and White seas	32,478	48,294	86,081	98,126	304,329	221,930	270,955
Russia on Black Sea	49,255	173,918	298,617	284,641	377,440	998,436	1,403,829
Spain	......	......	160	......	1,230	7,500	11,803
Sweden and Norway	43,689	36,064	127,868	172,145	231,952	261,726	270,033
Switzerland	......	......	......	......	260	226	135
Turkey in Europe	169	12,888	91	5,821	4,802	3,568	13,936
United Kingdom	414,677	337,455	333,791	874,296	982,188	1,435,330	708,379
Bermuda	93	106	110	76	67	333	191
British Honduras	......	44	......	......	......	36	6
Dominion of Canada:							
Nova Scotia, New Brunswick, etc	3,202	2,878	7,627	5,611	72,221	67,070	82,032
Quebec, Ontario, Manitoba, etc	43,465	115,530	124,008	430,285	1,106,574	1,186,141	1,636,731
British Columbia	497	586	1,159	4,849	10,054	5,735	10,977
Newfoundland and Labrador	240	129	151	133	3,609	624	133
Central American States:							
Costa Rica	......	40	33	7,585	120	1,794	2,580
Guatemala	150	......	......	91	4,162	890	864
Honduras	......	......	......	5	......	27	14
Nicaragua	45	......	141	1,312	28	......	1,460
Salvador	......	......	......	2,833	......	4,563	4,986
Mexico	1,675	4,121	4,158	8,511	4,383	16,284	14,380
West Indies:							
British	738	1,455	668	985	673	800	1,496
Cuba	......	8,309	23	......	8,191	6,707	5,088
Danish	......	......	......	3	7	53	......
Dominican Republic	......	......	729	74	9	27	25
French	......	......	38	......	5	66	......
Haiti	......	......	......	......	......	6	71
Porto Rico	......	688	......	......	......	......	......
Argentina	644,085	1,206,031	570,232	182,283	1,194,961	805,703	689,509
Bolivia	......	......	......	......	350	......	......
Brazil	......	50	......	908	249	2,140	1,828
Chile	12,449	56,231	6,300	10,425	16,807	5,671	16,924
Colombia	125	268	165	238	......	16	......
Ecuador	......	......	......	493	76	176	94
Guiana, British	......	104	82	58	23	81	109
Peru	47	......	......	......	1,152	225	621
Uruguay	65,192	77,809	88,491	46,208	79,139	115,122	42,482
Venezuela	19	17	......	58	27	70	155
Chinese Empire	80	......	......	3,551	3,616	6	283
China, Russian	......	......	......	......	......	......	50
East Indies							
British	2,542	210	1,417	5,503	6,035	4,399	5,389
Dutch	447	......	......	485	......	19	152

Statement showing the exports of agricultural machines and implements, etc.—Cont'd.

MOWERS AND REAPERS AND PARTS OF—continued.

Country.	1892.	1894.	1896.	1898.	1900.	1901.	1902.
Hongkong	....	....	....	$5	$2,034	$2,403	$1,457
Japan	$88	....	$14	226	2,893	3,340	20,355
Russia, Asiatic	....	....	2,618	26,601	28,297	74,911	24,010
Turkey in Asia	2,110	....	875	163	3,472	3,902	3,060
All other Asia	....	....	....	22	43	72	110
Australasia	187,026	$208,213	195,533	421,975	466,397	384,411	271,502
Hawaii	....	....	130	317	116	....	....
Philippine Islands	....	....	....	....	1,516	1,580	1,093
British Africa	61,058	79,743	190,542	90,018	69,332	45,154	37,728
French Africa	17,599	31,840	8,362	13,606	3,595	15,032	17,705
Portuguese Africa	....	....	2,990	1,253	761	....	....
Turkey in Africa (Egypt)	8,130	....	20,164	350	210	14	9,338
Total	2,372,938	3,261,982	3,212,423	5,500,665	11,243,763	9,943,680	8,818,370
Recapitulation.							
Europe	1,321,836	1,467,490	1,985,663	4,233,566	8,152,559	7,188,077	5,913,382
North America	50,105	133,886	138,845	462,353	1,210,103	1,291,156	1,761,034
South America	721,917	1,340,510	665,270	240,671	1,292,784	929,204	551,722
Asia	5,267	210	4,924	36,556	46,390	89,052	54,866
Oceania	187,026	208,213	195,663	422,292	468,029	385,991	272,595
Africa	86,787	111,583	222,058	105,227	73,898	60,200	64,771

PLOWS AND CULTIVATORS AND PARTS OF.

Austria-Hungary	$30	....	$1,719	$657	$8,722	$28,346	$4,097
Azores and Madeira Islands	247	$475	52	66	65	223	284
Belgium	1,048	1,060	393	5,899	1,338	11,736	8,477
Denmark	170	110	3,420	16,234	70,772	114,270	208,816
France	7,760	11,782	15,048	49,330	68,197	124,957	396,098
Germany	2,261	3,874	6,402	15,450	227,378	65,172	158,055
Gibraltar	36	....	....	....	20	....	136
Greece	....	....	....	....	1,996	183	....
Italy	1,000	5,205	3,204	4,450	24,979	26,036	52,375
Malta, Gozo, etc	....	....	....	....	....	....	22
Netherlands	415	231	119	768	10,596	1,270	2,269
Portugal	272	....	....	741	1,816	962	1,398
Roumania	96	....	....	760	4,455	980	5,097
Russia on Baltic and White seas	946	1,107	22,595	2,958	21,584	11,793	12,197
Russia on Black Sea	446	482	223	25,412	15,863	104,036	4,547
Spain	....	40	7,154	6,587	9,976	10,263	8,906
Sweden and Norway	3,000	5,749	15,755	21,667	46,033	42,637	58,897
Switzerland	....	....	77	....	....	....	....
Turkey in Europe	1,778	....	839	52	5,346	1,103	24,215
United Kingdom	8,165	27,594	43,105	74,763	179,950	98,513	158,652
Bermuda	376	226	416	249	368	172	416
British Honduras	86	....	9	....	2	4	10
Dominion of Canada:							
Nova Scotia, New Brunswick, etc	1,849	116	3,501	630	1,112	2,690	1,858
Quebec, Ontario, Manitoba, etc	11,690	11,642	35,659	181,181	243,913	223,716	355,601
British Columbia	1,067	745	1,306	952	2,010	7,415	8,262
Newfoundland and Labrador	1,263	450	67	46	271	287	377
Central American States:							
Costa Rica	514	299	527	424	123	200	103
Guatemala	818	660	2,261	248	262	649	723

Statement showing the exports of agricultural machines and implements, etc.—Cont'd.

PLOWS AND CULTIVATORS AND PARTS OF—continued.

Country.	1892.	1894.	1896.	1898.	1900.	1901.	1902.
Central American States—Continued.							
Honduras	$36	......	$157	$51	$41	$128	$79
Nicaragua	133	$5	100	18	20	28	48
Salvador	164	239	1,039	61	33	376	873
Mexico	21,201	36,080	50,313	47,730	183,261	114,411	48,659
Miquelon, Langley, etc	......	......	......	323	......	......	......
West Indies:							
British	1,782	2,012	1,503	2,820	6,257	2,916	2,556
Cuba	47,924	81,988	31,691	2,532	139,529	85,274	44,866
Danish	199	276	242	256	463	258	635
Dominican Republic	144	219	328	480	173	801	99
Dutch	40	6	......	......	......	7	25
French	10	205	173	223	45	60	......
Haiti	15	27	27	23	23	......	......
Porto Rico	2,559	5,359	3,372	2,335	6,418	......	......
Argentina	80,303	116,029	161,347	151,737	388,903	369,522	621,802
Bolivia	......	40	......	......	......	......	46
Brazil	4,847	8,965	13,250	11,275	24,673	6,463	12,686
Chile	17,274	21,487	21,094	38,137	54,886	46,731	29,184
Colombia	652	1,298	612	873	421	117	667
Ecuador	34	869	30	......	357	216	95
Guiana:							
British	......	......	......	9	15	......	211
Dutch	20	......	......	......	......	......	......
Paraguay	......	......	......	......	124	......	......
Peru	5,932	6,485	8,853	7,005	13,828	19,531	15,388
Uruguay	51,313	21,965	52,450	48,886	90,179	30,401	35,872
Venezuela	611	418	1,018	570	1,092	606	670
Aden	......	......	......	53	180	......	......
Chinese Empire	......	......	......	612	347	22	19
China, Russian	......	......	......	......	......	......	10
East Indies:							
British	50	1,425	549	1,560	989	1,541	3,018
Dutch	1,500	75	65	1,044	4,635	1,620	212
Hongkong	......	......	......	27	700	285	928
Japan	116	322	119	574	13,235	8,718	1,493
Russia, Asiatic	1,401	1,003	959	1,196	8,546	10,640	18,217
Turkey in Asia	613	6,260	......	2,800	2,989	1,104	3,011
Australasia	23,905	21,768	32,450	108,116	162,109	151,170	264,682
French Oceania	......	......	6	......	......	73	9
Guam	......	......	......	......	44	......	......
Hawaii	6,077	2,579	5,531	3,820	5,009	......	......
Philippine Islands	......	3,551	1,044	1,357	209	666	3,449
British Africa	83,255	125,695	181,894	74,281	111,707	148,448	185,590
Canary Islands	......	......	......	......	100	......	207
French Africa	120	311	709	3,133	6,243	6,544	20,951
Liberia	......	363	......	......	......	......	......
Portuguese Africa	......	......	9,875	1,060	2,047	1,292	1,996
Turkey in Africa (Egypt)	10	550	1,600	2,575	1,061	792	886
All other Africa	162	......	263	74	......	......	65
Total	397,735	539,721	746,604	927,250	1,178,098	1,888,373	2,791,092
Recapitulation.							
Europe	27,670	57,709	120,105	225,794	699,086	642,480	1,104,538
North America	91,870	140,554	132,691	340,582	584,324	439,391	465,190
South America	160,986	177,556	258,654	258,592	574,478	473,587	716,621
Asia	3,680	9,085	1,692	7,866	31,621	23,930	26,908
Oceania	29,982	27,898	39,031	113,293	167,371	151,909	268,140
Africa	83,547	126,919	194,413	81,123	121,218	157,076	209,695

Statement showing the exports of agricultural machines and implements, etc.—Cont'd.

ALL OTHER AGRICULTURAL IMPLEMENTS AND PARTS OF.

Country.	1892.	1894.	1896.	1898.	1899.	1901.	1902.
Austria-Hungary	...	...	$1,943	$4,643	$511	$4,165	$56,516
Azores and Madeira Islands	$663	$100	26	178	253	646	416
Belgium	24,129	14,616	36,604	35,659	32,430	108,093	32,135
Denmark	20,422	22,694	33,758	86,329	19,450	201,464	98,286
France	77,523	54,695	91,359	56,286	43,689	483,513	276,776
Germany	67,498	134,746	94,552	116,582	103,845	951,201	556,684
Gibraltar	33	...	...	...	...	...	...
Greece	...	...	...	...	...	...	3,075
Italy	3,723	6,750	4,303	6,553	8,578	43,816	25,870
Malta, Gozo, etc	...	...	...	...	...	...	800
Netherlands	21,137	9,372	31,118	99,489	229,992	229,966	27,432
Portugal	185	318	806	484	159	553	643
Roumania	1,208	2,131	176	201	1,182	3,130	32,047
Russia on Baltic and White seas	19,397	20,644	3,291	7,327	23,534	58,487	153,040
Russia on Black Sea	4,746	26,745	46,815	7,123	32,496	169,666	449,872
Spain	1,425	812	234	50	801	986	10,227
Sweden and Norway	12,362	8,5[illegible]6	7,228	4,426	14,308	34,988	22,447
Switzerland	...	...	20	62	...	40	1,000
Turkey in Europe	164	423	370	...	1,542	11,710	29,106
United Kingdom	201,298	231,882	211,654	195,966	262,597	361,549	320,618
Bermuda	337	440	464	318	359	362	352
British Honduras	564	29	157	82	21	...	38
Dominion of Canada:							
Nova Scotia, New Brunswick, etc	1,134	14,766	9,770	16,727	41,541	37,075	19,316
Quebec, Ontario, Manitoba, etc	66,660	65,154	168,106	136,387	325,013	581,238	996,186
British Columbia	1,425	5,124	5,589	3,591	7,830	14,537	10,100
Newfoundland and Labrador	3,171	5,021	2,701	1,023	4,228	576	2,087
Central American States:							
Costa Rica	1,205	1,907	1,811	1,205	1,063	812	1,916
Guatemala	4,547	2,857	4,128	342	423	2,363	4,383
Honduras	137	113	120	86	350	275	479
Nicaragua	1,100	964	3,111	479	195	400	628
Salvador	1,751	3,262	553	88	68	752	1,832
Mexico	71,454	55,208	65,367	68,127	137,796	219,426	167,285
Miquelon, Langley, etc	...	...	...	97	...	...	...
West Indies:							
British	5,091	1,202	2,779	1,447	1,665	3,858	1,790
Cuba	36,518	27,972	5,112	5,285	9,811	13,417	11,898
Danish	191	80	159	202	184	147	90
Dominican Republic	295	825	1,924	525	304	2,268	468
Dutch	20	429	36	22	193	571	...
French	175	178	90	62	120	94	78
Haiti	973	228	394	746	286	144	199
Porto Rico	101	1,463	3,595	169	311	...	...
Argentina	57,552	192,134	122,488	43,034	163,274	245,353	628,511
Bolivia	48	...	...	...	12	...	...
Brazil	26,536	11,068	22,417	12,472	11,045	6,507	9,837
Chile	48,918	76,319	67,258	31,046	30,626	55,360	63,286
Colombia	1,850	2,319	1,983	3,732	1,009	1,182	386
Ecuador	154	1,095	366	251	876	124	944
Guiana:							
British	519	364	773	37	9	353	1,328
Dutch	327	63	400	...	...	224	41
French	43	...	...	...	9	67	8
Peru	2,233	3,394	2,550	4,318	1,834	4,830	3,816

Statement showing the exports of agricultural machines and implements, etc.—Cont'd.

ALL OTHER AGRICULTURAL IMPLEMENTS AND PARTS OF—continued.

Country.	1892.	1894.	1896.	1898.	1899.	1901.	1902.
Uruguay	$10,292	$9,893	$17,354	$8,272	$10,003	$7,614	$11,870
Venezuela	838	2,206	5,095	281	789	2,508	553
Chinese Empire	12,500	63	60	120	58	1,684	1,369
China, Russian	....	....	....	....	....	....	450
East Indies:							
British	499	426	91	1,270	1,214	1,093	48,708
Dutch	....	....	39	380	3,433	19	225
Hongkong	120	....	....	2,645	600	1,230	3,448
Japan	2,241	1,207	1,190	2,601	9,809	30,341	5,384
Russia, Asiatic	6,166	10,638	15,130	5,203	3,818	42,698	61,289
Turkey in Asia	....	....	600	314	205	288	7,369
All other Asia	70	23	....	....	732	23	....
Australasia	113,005	128,439	57,739	167,474	243,775	471,314	428,328
British Oceania	....	....	....	....	....	....	12
French Oceania	....	224	....	143	....	....	211
Hawaii	871	3,036	2,111	1,790	5,551	....	....
Philippine Islands	....	5,913	52	95	50	882	9,602
Tonga, Samoa, and all other	....	....	....	15	....	....	....
Tutuila	....	....	....	....	....	....	171
British Africa	81,266	53,860	55,163	36,247	34,596	42,466	59,506
Canary Islands	274	272	139	172*	175	192	141
French Africa	5,189	914	....	478	877	21,633	1,541
German Africa	....	....	....	....	....	450	....
Liberia	36	43	218	6	50	110	73
Portuguese Africa	....	38	4,309	877	1,369	453	725
Turkey in Africa (Egypt)	....	665	....	11	31	30	10,526
All other Africa	....	....	....	165	....	....	1,505
Total	1,024,310	1,226,302	1,217,748	1,191,817	1,832,957	4,481,381	4,677,278
Recapitulation.							
Europe	455,913	534,464	564,257	621,348	775,367	2,663,973	2,096,990
North America	196,850	187,222	275,966	237,010	531,761	878,315	1,219,125
South America	149,310	298,855	240,684	103,443	219,486	324,182	720,580
Asia	21,596	12,357	17,110	12,533	19,869	77,376	128,242
Oceania	113,876	137,612	59,902	169,517	249,376	472,201	438,324
Africa	86,765	55,792	59,829	37,956	37,098	65,334	74,017

The first appearance of agricultural implements in the export publications of the United States Government was in the year 1864. The following statement shows their annual exports from that year to 1902, both years inclusive:

Exports of American agricultural implements, 1864–1902.

Year.	Value.	Year.	Value.
1864	$611,152	1874	$3,089,753
1865	1,395,556	1875	2,625,372
1866	1,373,004	1876	2,256,449
1867	936,210	1877	1,815,873
1868	673,381	1878	2,575,198
1869	1,037,530	1879	2,933,388
1870	1,068,476	1880	2,245,742
1871	1,070,946	1881	2,400,318
1872	1,547,413	1882	2,976,371
1873	2,585,914	1883	3,883,919

Exports of American agricultural implements, 1864–1902—Continued.

Year.	Value.	Year.	Value.
1884	$3,442,767	1894	$5,027,915
1885	2,561,602	1895	5,413,075
1886	2,367,258	1896	5,176,775
1887	2,138,398	1897	5,240,686
1888	2,645,187	1898	7,609,632
1889	3,623,769	1899	12,432,197
1890	3,859,184	1900	16,099,149
1891	3,219,130	1901	16,313,434
1892	3,794,983	1902	16,286,740
1893	4,657,333		

CARRIAGES, CARTS, AND VEHICLES

Statement showing the exports of carriages, carts, and vehicles of all kinds (railway cars, passenger and freight, not included) from the United States to the several countries during the years 1898–1902.

Country.	1898.	1899.	1900.	1901.	1902.
Austria-Hungary	$1,642	$795	$1,332	$7,897	$14,546
Azores and Madeira Islands	...	...	68	149	151
Belgium	11,824	17,756	18,976	14,814	23,383
Denmark	931	795	5,881	1,903	12,408
France	37,390	75,323	139,319	29,852	77,383
Germany	64,693	66,471	136,155	81,045	76,577
Gibraltar	...	...	75	922	1,423
Greece	...	...	...	47	...
Italy	4,723	8,339	4,181	9,949	6,263
Malta, Gozo, etc	560	...	143	367	687
Netherlands	3,599	6,978	14,196	13,358	15,049
Portugal	...	20	810	155	1,101
Roumania	...	264	...	61	...
Russia on Baltic and White seas	2,008	3,574	1,978	3,721	4,022
Russia on Black Sea	54	306	1,249	...	30
Spain	67	...	858	3,181	312
Sweden and Norway	2,557	4,407	5,583	2,017	2,565
Switzerland	...	...	4	748	450
Turkey in Europe	613	700	250	144	442
United Kingdom	471,172	541,455	821,774	927,678	1,224,379
Bermuda	6,776	10,516	6,559	16,403	13,809
British Honduras	1,914	784	408	1,041	900
Dominion of Canada:					
Nova Scotia, New Brunswick, etc	10,506	9,757	13,240	18,218	12,737
Quebec, Ontario, Manitoba, etc	80,292	98,718	96,027	147,912	385,514
British Columbia	20,533	27,685	27,757	45,919	40,189
Newfoundland and Labrador	853	882	1,128	1,384	1,962
Central American States:					
Costa Rica	11,219	5,868	2,152	4,616	3,102
Guatemala	2,284	1,677	1,160	13,007	2,300
Honduras	3,779	5,006	3,636	8,682	4,946
Nicaragua	1,813	1,481	1,199	3,163	1,019
Salvador	600	2,153	1,214	976	844
Mexico	117,477	174,520	257,150	289,612	298,430
Miquelon, Langley, etc	...	...	35	...	48
West Indies:					
British	40,511	50,477	61,075	48,789	57,126
Cuba	2,864	49,389	112,211	104,176	96,742
Danish	3,228	3,884	2,552	3,703	3,710
Dominican Republic	8,974	5,462	4,740	9,356	6,941

Statement showing the exports of carriages, carts, and vehicles, etc.—Continued.

Country.	1898.	1899.	1900.	1901.	1902.
West Indies—Continued.					
Dutch	$2,978	$1,054	$1,878	$1,176	$828
French	5,928	7,760	8,278	7,893	5,685
Haiti	8,139	6,215	9,534	18,912	9,629
Porto Rico	5,821	6,171	15,234	....	....
Argentina	62,935	151,713	178,621	124,243	144,129
Bolivia	16	206	1,294	629	144
Brazil	9,980	7,133	10,957	7,569	5,761
Chile	10,024	9,077	7,258	18,404	8,743
Colombia	16,460	11,261	10,053	6,293	13,920
Ecuador	2,707	2,387	2,588	5,892	12,722
Guiana:					
British	3,004	2,773	2,938	2,031	1,205
Dutch	291	733	115	1,069	....
French	200	176	449	308	86
Paraguay	12	....	....	218	61
Peru	531	3,045	4,853	5,709	12,880
Uruguay	1,470	3,073	5,902	3,719	8,336
Venezuela	6,913	5,622	7,398	10,998	14,338
Aden	585	1,430	1,727	882	2,400
Chinese Empire	4,248	967	2,020	1,979	8,665
China, Russian	....	....	....	....	2,478
East Indies:					
British	8,952	15,091	23,940	23,273	21,178
Dutch	7,308	4,447	7,538	7,587	9,393
Hongkong	3,348	2,307	80	1,403	1,831
Japan	3,327	1,860	5,023	11,652	14,786
Korea	....	....	1,100	150	....
Russia, Asiatic	1,181	354	1,068	1,768	2,533
Turkey in Asia	80	....	663	710	491
All other Asia	31	60	3,434	929	1,827
Australasia	311,410	346,442	483,729	464,638	451,603
British Oceania	....	....	....	....	1,833
French Oceania	4,748	2,878	3,634	4,939	4,736
Guam	....	....	172	....	141
Hawaii	38,730	63,623	123,382	....	....
Philippine Islands	2,511	741	29,920	33,267	44.872
Tonga, Samoa, and all other	601	813	924	539	....
Tutuila	....	....	....	....	80
British Africa	238,473	195,377	105,804	200,551	229,754
Canary Islands	....	....	111	100	385
French Africa	....	12	1,509	160	383
Liberia	....	38	25	134	45
Madagascar	....	1,084	....	....	....
Portuguese Africa	5,880	4,168	2,336	2,106	3.380
Turkey in Africa (Egypt)	1,160	800	190	3,383	890
All other Africa	400	6,455	....	....	4.950
Total	1,685,838	2,047,788	2,809,784	2,790,178	3,438,591
Recapitulation.					
Europe	601,833	727,183	1,151,862	1,098,008	1,461,171
North America	336,489	469,459	627,167	744,938	946,461
South America	114,543	199,199	232,426	187,082	222,325
Asia	29,060	29,516	46,593	50,333	65,582
Oceania	358,000	414,497	641,761	503,383	503,265
Africa	245,913	207,934	109,975	206,434	239,787

Value of exports of American carriages and cars and parts of, from 1800 to 1902.

Fiscal year.	Cars, carriages, and parts of.	Fiscal year.	Cars, carriages, and parts of.
1800	$16,678	1852	$172,445
1801	13,468	1853	184,497
1802	23,285	1854	244,638
1803	9,893	1855	290,525
1804	14,755	1856	370,259
1805	20,279	1857	476,394
1806	30,293	1858	777,921
1807	25,390	1859	655,600
1808	4,243	1860	816,973
1809	7,167	1861	472,080
1810	10,762	1862	519,175
1811	21,252	1863	764,547
1812	2,210	1864	620,128
1813	200	1865	1,282,155
1814	....	1866	566,124
1815	9,176	1867	572,407
1816	30,920	1868	404,072
1817	37,290	1869	803,828
1818	36,360	1870	976,542
1819	26,247	1871	765,232
1820	28,555	1872	1,419,999
1821	20,360	1873	1,651,894
1822	26,299	1874	1,693,782
1823	33,233	1875	1,181,436
1824	29,954	1876	1,147,963
1825	44,984	1877	1,405,015
1826	55,846	1878	1,511,843
1827	54,450	1879	1,273,128
1828	60,894	1880	1,407,425
1829	42,150	1881	1,557,685
1830	51,190	1882	2,832,062
1831	49,490	1883	3,508,405
1832	45,277	1884	3,026,498
1833	28,830	1885	1,864,528
1834	50,683	1886	1,927,890
1835	83,525	1887	2,107,399
1836	103,652	1888	2,243,756
1837	100,565	1889	3,090,521
1838	42,207	1890	4,746,678
1839	52,950	1891	4,905,022
1840	74,416	1892	3,266,115
1841	60,456	1893	2,577,473
1842	48,509	1894	3,351,398
1843	48,036	1895	2,384,648
1844	63,931	1896	4,785,610
1845	55,871	1897	9,952,033
1846	87,712	1898	10,270,948
1847	75,369	1899	9,860,164
1848	89,963	1900	9,905,610
1849	95,923	1901	10,920,931
1850	95,722	1902	9,872,516
1851	199,421		

2. EXPORTS OF BRITISH AGRICULTURAL MACHINES AND IMPLEMENTS.

The following statements, prepared in the Bureau of Statistics from British official publications, showing the exports of agricultural machines and implements from the United Kingdom during the years 1898–1902, will be of interest to our manufacturers of similar machines and implements, not only as to the volume of the trade, but particularly as to its universality.

BRITISH AGRICULTURAL MACHINERY.

Statement showing the exports of agricultural machinery from the United Kingdom to the several countries during the years 1898–1902.

STEAM ENGINES.

Country.	1898.	1899.	1900.	1901.	1902.
Russia	$794,057	$1,000,957	$1,107,591	$893,996	$1,014,237
Norway	21,904	30,114	23,009	25,340	10,458
Denmark	71,275	59,459	54,569	48,067	43,375
Germany	757,525	810,759	905,198	759,602	669,855
Holland	166,006	181,754	123,147	89,792	53,410
Belgium	82,322	116,456	89,037	65,752	59,946
France	120,086	190,115	148,448	31,778	58,559
Portugal	15,544	8,278	1,767	21,442	42,032
Spain	12,312	30,771	6,741	20,546	59,289
Italy	150,399	174,367	159,884	139,318	137,699
Austria-Hungary	151,490	102,547	32,236	....	3,090
Roumania	90,468	13,918	9,962	22,551	23,354
Turkey	35,628	11,478	46,393	17,554	6,891
Egypt	89,909	112,436	164,527	139,537	195,239
Algeria	60,885	49,114	61,800	....	42,864
Islands of the Pacific	94,712	76,818	30,284	....	3,907
Mexico	33,890	71,168	38,391	43,974	73,733
Peru	2,798	9,281	15,646	41,657	....
Chile	10,040	9,879	40,509	19,033	9,300
Brazil	65,664	33,155	28,250	16,065	19,466
Uruguay	14,434	26,888	17,831	23,213	21,208
Argentine Republic	62,855	176,698	219,971	263,964	123,060
Other foreign countries	127,750	103,550	62,500	52,837	52,895
Total foreign countries	3,031,953	3,399,960	3,387,691	2,736,018	2,723,867
British colonies:					
Cape of Good Hope	40,012	9,782	27,477	20,965	34,070
Natal	7,952	4,477	1,017	14,293	56,184
East Indies	100,625	125,337	116,212	101,077	64,574
Australia	161,734	139,454	128,023	136,744	174,610
Other British colonies	5,558	27,248	16,244	12,848	21,043
Total British colonies	315,881	306,298	288,973	285,927	350,481
Grand total	3,347,834	3,706,258	3,676,664	3,021,945	3,074,348

Statement showing the exports of agricultural machinery, etc.—Continued.

AGRICULTURAL MACHINERY, NOT BEING STEAM ENGINES.

Country.	1898.	1899.	1900.	1901.	1902.
Russia	$568,762	$716,091	$718,038	$660,263	$869,157
Sweden	48,573	48,622	16,580	43,049	38,504
Norway	33,783	40,713	24,744	25,374	24,734
Denmark	68,078	70,662	60,403	62,330	56,471
Germany	1,117,144	1,140,674	1,000,149	644,183	696,713
Holland	155,242	204,923	238,541	186,032	184,212
Belgium	98,999	112,271	124,237	99,024	81,144
France	491,220	650,540	574,675	559,623	489,312
Portugal	13,879	19,763	24,274	36,358	62,486
Italy	130,344	144,998	134,759	109,530	105,161
Roumania	105,730	43,852	12,346	55,517	81,139
Egypt	35,365	39,570	79,806	48,451	97,564
Algeria	50,947	31,866	25,564	94,868	104,542
Chile	34,506	23,072	45,298	34,285	30,002
Brazil	67,164	63,513	50,301	37,847	59,289
Uruguay	18,746	31,613	26,241	9,188	15,305
Argentine Republic	123,731	349,585	385,203	308,697	240,698
Other foreign countries	306,580	312,371	186,903	121,750	164,800
Total foreign countries	3,468,793	4,044,699	3,728,062	3,136,369	3,401,233
British colonies:					
Cape of Good Hope	89,519	90,381	54,666	102,703	141,309
Natal	31,890	23,525	22,006	28,124	83,164
East Indies	38,499	52,062	70,905	68,895	54,614
Australasia	461,544	353,649	345,327	203,075	196,524
Other colonies	48,631	34,626	25,622	27,778	44,665
Total British colonies	670,083	554,243	518,526	430,575	550,276
Grand total	4,138,876	4,598,942	4,246,588	3,566,944	3,951,509

BRITISH AGRICULTURAL IMPLEMENTS AND TOOLS.

Statement showing the exports of agricultural implements and tools from the United Kingdom to the several countries during the years 1898–1902.

Country.	1898.	1899.	1900.	1901.	1902.
Russia	$34,640	$58,374	$77,913	$78,005	$64,730
Norway	17,967	11,465	11,646	8,783	13,290
Denmark	19,855	15,257	15,145	12,780	13,543
Germany	105,185	143,017	63,065	45,107	26,533
Holland	42,523	41,331	40,577	38,791	24,216
Belgium	15,014	17,588	10,770	11,217	10,580
France	19,028	24,547	16,366	11,737	20,176
Portugal	7,685	8,424	9,368	10,521	10,215
Spain	8,643	11,680	9,179	6,230	6,842
Turkey	3,407	4,010	5,261	6,915	8,059
Portuguese East Africa	11,105	11,558	4,443	4,180	38,402
Dutch India	5,553	5,660	4,433	6,628	8,098
Other Dutch possessions except Borneo	4,127	3,153	2,798	6,239	5,241
Philippines	5,076	1,465	5,981	6,755	11,086
United States	19,875	22,386	6,745	15,000	17,918
Porto Rico	17,281	34,937	14,249	15,894	40,241
Cuba		70,910	67,021	54,427	47,035
French West Indies	3,309	3,553	5,012	5,100	5,110
Haiti and Dominican Republic	10,633	7,003	15,315	15,880	9,767
Mexico	58,108	57,196	51,250	40,202	36,670
Guatemala	6,755	12,225	15,544	35,579	29,355
Colombia	37,443	15,724	5,898	6,657	7,528
Venezuela	46,334	37,238	49,639	66,720	29,647
Ecuador	20,157	26,153	23,870	13,704	15,568
Peru	33,121	35,623	29,068	35,024	16,210
Chile	25,510	26,046	39,340	14,940	21,831
Brazil	369,635	291,143	335,827	433,693	429,435
Uruguay	9,860	19,563	10,877	7,115	5,757
Argentine Republic	62,624	127,385	85,543	102,280	131,775
Other foreign countries	44,957	43,282	63,542	39,599	41,808
Total to foreign countries	1,064,410	1,187,896	1,095,685	1,155,702	1,146,673
British colonies:					
West Africa	10,482	7,159	6,808	19,228	14,799
Cape of Good Hope	140,287	164,065	136,914	99,238	191,180
Natal	65,815	63,416	45,190	82,477	144,511
Mauritius	4,643	5,037	5,509	5,986	8,176
British East Indies	197,346	179,228	225,475	198,125	202,052
Straits Settlements	12,760	17,962	24,853	29,564	21,048
Ceylon	24,561	21,802	25,773	32,902	35,993
Australasia	297,475	237,198	213,012	198,407	198,553
Canada	8,220	17,131	15,218	17,554	20,254
Newfoundland	1,392	3,966	2,915	4,875	3,051
West Indies	58,714	60,107	49,206	50,087	60,510
Other British possessions	21,787	25,665	22,391	22,177	22,216
Total British colonies	843,482	802,736	773,264	760,620	922,343
Grand total	1,907,892	1,990,632	1,868,949	1,916,322	1,069,016

Recapitulation.

Article	1898.	1899.	1900.	1901.	1902.
Machinery:					
Steam engines	$3,347,834	$3,706,258	$3,176,664	$3,021,945	$3,074,348
Other	4,138,876	4,598,942	4,246,588	3,566,944	3,951,509
Implements and tools	1,907,892	1,990,632	1,868,949	1,916,322	1,069,016
Total	9,394,602	10,295,832	9,792,201	8,505,211	8,094,873

BRITISH CARRIAGES, CARTS, AND VEHICLES.

Exports of carriages, carts, and vehicles, and parts of, from the United Kingdom to the several countries during the years 1898–1902.

Country.	1898.	1899.	1900.	1901.	1902.
Russia	$6,690	$12,375	$10,625	$13,195	$3,665
Sweden	2,275	4,520	10,400	3,000	7,455
Norway	3,735	9,370	5,000	2,405	3,015
Denmark	9,770	13,125	21,425	20,470	17,635
Germany	20,340	26,755	29,395	26,955	19,500
Holland	36,090	35,000	46,100	22,630	26,450
Belgium	40,665	52,675	43,350	66,985	34,285
France	123,275	143,630	172,825	301,885	67,390
Portugal	1,220	4,745	5,190	2,010	2,885
Spain	24,690	6,255	9,605	34,885	8,850
Italy	5,990	4,895	5,735	6,990	6,490
Roumania	5,120	175	500	1,585	430
Turkey	2,415	4,580	10,070	3,235	7,000
Egypt	9,185	16,595	15,290	15,135	19,349
East Africa, Portuguese	14,140	6,810	7,650	8,575	14,825
Java	7,480	11,895	17,060	19,700	11,215
Philippines	1,620	3,635	12,080	8,055	5,370
Siam	8,195	7,740	8,000	8,315	6,800
China	8,245	7,560	7,690	14,795	22,530
Japan	4,135	1,100	6,370	10,290	8,545
United States	15,000	30,880	61,830	44,370	37,100
Chile	9,640	3,370	4,885	3,675	4,775
Brazil	4,040	9,510	7,960	5,120	12,315
Argentine Republic	24,360	19,725	30,375	21,745	12,755
All other foreign countries	13,908	12,484	13,128	8,467	30,840
Total foreign countries	402,223	449,404	562,538	674,472	391,460
British colonies:					
West Africa	8,215	7,480	9,135	10,325	20,420
Cape of Good Hope	225,270	167,850	290,400	192,500	508,390
Natal	77,165	69,910	98,615	132,800	240,405
British East Indies	147,280	184,065	152,270	185,995	230,005
Ceylon	9,125	16,000	9,520	23,665	14,170
Straits Settlements	9,065	11,275	15,810	31,120	18,870
Australasia	276,385	315,845	450,940	389,900	355,585
Canada	6,995	12,615	4,520	13,610	19,415
West Indies	10,880	5,860	8,790	9,460	7,465
All other	15,880	16,507	11,947	9,860	16,889
Total British colonies	786,260	807,407	1,051,947	699,234	1,431,614
Grand total	1,188,483	1,256,811	1,614,485	1,673,706	1,823,074

AGRICULTURAL IMPLEMENTS AND VEHICLES IN FOREIGN COUNTRIES.

EUROPE.

AUSTRIA-HUNGARY.

AUSTRIA.

(From United States Consul-General Rublee, Vienna, Austria.)

HAND LABOR VS. MACHINERY.

In Austria-Hungary it is not so much the cost of hand labor as it is the scarcity of such labor that has brought about a considerable increase in the use of labor-saving machinery. There has been so much emigration from Austria-Hungary in recent years, and the pay in factories is relatively so much greater than on the farms, that laborers are no longer to be had in sufficient number to make it possible to work the agricultural districts by hand labor to the same extent as in former years. The demand for agricultural implements has, therefore, increased very largely of late.

AGRICULTURAL IMPLEMENTS IN USE.

Modern agricultural implements are now generally introduced throughout the Empire and are used more from year to year. These implements are to a large extent manufactured in Austria-Hungary, though American and German machinery is sold in the Empire. In mowers, reapers, and binders the Austrians do not succeed in overcoming the competition of American manufacturers at the present time, though there are five large factories engaged in manufacturing such machinery, and it is expected that, should the proposed increase in the tariff go through, the foreign machines will be deprived of their present advantage in the Austrian market.

AMERICAN AGRICULTURAL IMPLEMENTS.

American agricultural implements have been sold in Austria-Hungary for many years, and there has at all times been a fair demand for them. At present, I am informed, the market is largely overstocked with American machinery and, the bad weather having done great damage to the crops, there is a poor outlook for business in this line.

HOW TO INCREASE AMERICAN TRADE.

The question of increasing the trade in agricultural machinery is a difficult one to answer satisfactorily. It is nearly always possible to increase trade if the proper methods are adopted. What the methods should be in this case can not be determined without the most careful investigation on the part of those interested. From what I have been able to learn, the principal factor for the development of this trade is to place it in the hands of capable business men in Austria. The conditions in the Empire are not favorable to an increase of trade with the United States. The Austrians fear that Americans will become too great competitors in their home market and are inclined to place restrictions on the trade with the United States. Under these circumstances it seems advisable to form connections with reputable houses in Austria for the sale of American machinery, inasmuch as the Austrians are likely to understand how to overcome the opposition to the introduction of American machinery better than American salesmen. This is written on the assumption that great care is to be taken in the selection of Austrian representatives. I am unable to name any houses that I feel certain would take an interest in promoting this business, for the reason that general information of this character does not seem to me to cover this case. Manufacturers would do well to make personal investigations of the field. It would seem to me an excellent plan to place the business in the hands of a reliable and energetic Austrian firm, with perhaps one American representative on the ground. The Austrian market is, to be sure, a limited one, as agriculture is not on the same scale as in the United States, and never will be. This is due to many adverse conditions in the soil and climate which militate against such agricultural results as are attained in the United States. Besides, it must be borne in mind that Austria imports less agricultural machinery per square kilometer of agricultural land than any other country in Europe.

DUTIES.

The tariff rate on agricultural implements from the United States amounts to $3.57 per 100 kilograms (220 pounds) at present. The proposed increase in the tariff will make the rate $5 per 100 kilograms. The present prospect is that this increase will be adopted before the year is over.

W. A. RUBLEE, *Consul-General.*

VIENNA, AUSTRIA, *July 29, 1903.*

HUNGARY.

(*From United States Consul Chester, Budapest, Hungary.*)

PAST AND PRESENT AGRICULTURAL CONDITIONS.

Prof. Arpad Hensch, of the Royal Hungarian Agricultural Academy at Magyar Ovar, wrote in 1896, at the time of the Hungarian Millennial Exposition, that great changes had taken place in Hungary's agricultural methods. "In 1870," he said, "the ordinary wooden plows were so extensively used that their number was half that of all the plows employed. Gradually they were superseded by the Vidats and later by the Sack plows, and on large estates, in addition to wooden agricultural machinery, steam plows came into favor."

This year Ernest Eber contributes an article on agricultural machinery in Hungary to the Köztelek, a widely read agricultural journal, in which it is stated that any increase in the import duties on agricultural apparatus will be detrimental to Hungary's welfare, as Hungary needs agricultural machinery of the best sort.

The Hungarian agricultural statistics (compiled during 1897–1900) give the following data as to machines, etc., in use:

Article.	Hungary proper.	Croatia-Slavonia.
	Number.	*Number.*
Steam plows	159	20
Sowers	44,168	1,766
Reapers	4,964	8,365
Steam thrashers	8,920	589
Other thrashers	46,814	2,528

These figures are probably an underrating of the present actual number, yet it is calculated that in the German Empire ten times as many plows, four times as many sowers, nearly ten times as many reapers, and almost thirty times as many steam thrashers are in use. Mr. Eber explains this anomaly by the fact that there is a larger percentage of smaller agricultural machinery in use on small and diminutive estates in Germany than in Hungary, the ratio being 254 to 24 in the case of steam plows. On the other hand, he points out that in Hungary large landowners are using a greater proportion of the larger kinds of machinery and vehicles than those in Germany, even though the lack of hand labor is less here than in Germany.

Mr. Eber believes that there is a lack of money and credit in Hungary among the small farmers, not to speak of the lack of institutions affording "communal use of the larger sorts of machines in vogue in Germany." Furthermore, the machinery is more expensive in Hungary, owing to the limited amount of home manufacture and the proportionally heavy duty imposed by Austria-Hungary on imported machines. Hence Hungary's development, agriculturally speaking, depends now on the maintenance of the low import duties on farming implements and machinery and on the spread of institutions enabling small farmers to buy expensive machinery on credit.

American exporters will be glad to know that the duties have not been raised in the proposed new tariff, although it is commonly so stated, owing to the fact that since 1892 the United States has enjoyed the most-favored-nation privilege of lower duties. It is of course important that this privilege should be preserved intact, providing the lower duties can not be secured by a reciprocity convention. As this consulate has already reported, cooperative associations have been formed in Hungary in the last few years, so that there was never a better opportunity than now to introduce American machinery on small farms.

HAND LABOR VS. MACHINERY.

Not only the cost of labor, but the frequent agricultural-labor strikes and inefficient working of the agricultural-labor laws of Hungary (including Croatia-Slavonia) justify the use and importation by Hungary of labor-saving machinery.

MACHINES IN USE.

Modern implements and machines are already in use here and are almost entirely imported, a branch of the McCormick Harvesting Machine Company having been established in Budapest for nearly five years. The manufactory of most importance in Hungary is the machine shop of the Hungarian State Railway.

HOW TO INCREASE AMERICAN TRADE.

American trade can be increased without difficulty by the maintenance of the present most-favored-nation rates or by securing lower rates by a special reciprocity convention with Austria-Hungary, especially in lines which Austria does not manufacture.

DEALERS IN AGRICULTURAL IMPLEMENTS.

Houses in Budapest importing agricultural machinery, vehicles, and implements are:

Agricultural machinery.

Conrad & Co., VI, Teréz körút, 15.
Alexander Heiszler, VI, Eötvös utcza, 36.
Horvath & Herczeg, VI, Podmaniczky w., 17.
Kann & Heller, V, Váczi körút, 62.
Paul Kotzó, V, Lipót körút, 18.
Ormai & Co., VI, Nagymezö w., 43.
Oscar Takócs, IX, Köztelek w., 6.
Joseph Schwarcz & Co., V, Váczi körút, 26.
Wohanka & Co., V, Váczi körút, 76.

General machinery.

Geittner & Rausch, VI, Andrassy út 8.
Hugo Graepel, VI, Váczi út, 46.
Ignatz Terényi, VI, Eötvös w., 38.
Samuel Propper, V, Váczi körút, 52.
Rudolph Gebhardt, V, Váczi körút, 32.
Goldmann & Varju, V, Lipot körút, 12.
Kalman & Engel, VI, Podmaniczky w., 8.
Beck & Gergely, V, Vaczi út, 12.

Implements.

Geittner & Rausch, VI, Andrassy út, 8.
Kann & Heller, V, Váczi körút, 62.
J. L. Brunner & Co., V, Váczi körút, 48.

DUTIES.

The most-favored-nation tariff rates are still in force and will be until the proposed new tariff of Austria-Hungary is passed and put into effect, and are given in the "Papers relating to the commercial arrangement between the United States and Austria-Hungary, proclaimed May 26, 1892," issued by the Department of State. The full list of original rates, regardless of treaty arrangement, are given in Vol. XVI, part 1, of SPECIAL CONSULAR REPORTS "Tariffs of Foreign Countries."

AGRICULTURE IN CROATIA-SLAVONIA.

In addition to presenting the foregoing considerations in favor of the export of American agricultural machinery to Hungary, the undersigned desires to call the attention of the American exporters to a fact which is not generally known, viz: The jurisdiction of the Royal Hungarian Ministry of Agriculture in Budapest extends to Croatia-Slavonia only in matters of river regulation and forestry supervision. Hence the crop reports of Croatia-Slavonia are autonomously made up in Zagreb (Agram), Croatia, and are not commonly included in the Hungarian statistics and reports. When it is considered that in Croatia-Slavonia the land devoted to the production of grain is only 10 per cent less in extent than that of Hungary proper, that the credit unions or cooperative associations began earlier in the former Province, and that Hungary proper has already an agricultural-machine experiment station in Magyar Ovar, near Budapest, to pronounce judgment on foreign vs. domestic machines, while Croatia-Slavonia as yet has no such station, it is natural to conclude that the latter is a freer field for such machinery. It is a fact that the heavy emigration of laborers from Croatia-Slavonia and the extensive advertising of foreign firms in Croatian-Slavonian papers (not allowed in Hungary proper) has much to do with the high figure given by the Zagreb statistician of reapers and mowers in use. Owing to the higher percentage of land in Croatia-Slavonia devoted to hoed crops, agricultural implements used in their harvesting would find a good market in that section of the Kingdom.

SHIPPING IMPLEMENTS TO HUNGARY.

Finally, the attention of American exporters of agricultural machines and vehicles is called to the advantages of shipping the same direct from New York to Fiume, Hungary's port.

FRANK DYER CHESTER, *Consul.*

BUDAPEST, HUNGARY, *June 23, 1903.*

HUNGARIAN IMPORTS OF AGRICULTURAL MACHINES AND VEHICLES.

[Inclosure.]

The following table shows the imports of agricultural machines, implements, and vehicles into Hungary during the year 1901, and the countries whence imported:

Description.	Whence imported.	Number.	Weight.	Value.
			Pounds.	
Steam thrashers	Austria	400	3,055,575	$241,967.81
	Great Britain	40	403,441	28,976.22
	Italy	1	2,424	174.17
Parts of steam thrashers	Austria		712,967	59,085.18
	Germany		132,055	11,953.70
	Great Britain		6,613	548.10
Whim thrashers	Austria	1,409	1,097,670	65,696.90
Parts of whim thrashers	Austria		193,784	13,392.75
	Germany		1,984	137.00
	Great Britain		440	30.45
Hand thrashers	Austria	683	381,395	21,071.40
	Germany	1	220	12.18
Parts of hand thrashers	Austria		23,148	1,598.60
	Germany		440	30.45
Whims (gins)	Austria	1,569	1,543,881	75,345.25
	Germany		661	32.25
Parts of whims	Austria		151,235	9,469.50
	Germany		1,322	82.80
Harvesters and reapers	United States	242	254,190	16,384.13
	Austria	196	189,154	18,288.25
	Great Britain	5	10,361	954.10
Parts of harvesters and reapers	Austria		63,374	7,573.40
	United States		11,463	1,372.28
	Germany		3,747	438.63
	Great Britain		2,645	316.68
	France		1,543	184.70
Sowers	Austria	2,507	2,248,471	211,180.50
	Germany	13	14,329	1,087.55
Parts of sowers	Austria		85,537	7,888.55
	Germany		9,479	829.25
	Great Britain		1,322	115.17
	United States		220	19.25
Grain cleaners and clover sifters	Austria	2,140	602,296	49,913.60
	Germany	12	5,291	438.00
	Italy	1	1,102	91.35
	France	1	441	36.55
Parts of grain cleaners and clover sifters	Austria		18,077	1,697.00
	Germany		220	20.70
Sorters (grain separators)	Austria	721	230,380	29,798.90
	Germany	14	3,968	511.56
Parts of grain separators	Austria		56,217	8,541.22
	Germany		1,764	267.95

Description.	Whence imported.	Number.	Weight.	Value.
			Pounds.	
Plows and parts of	Austria		7,078,309	$371,510.10
	Germany		765,878	36,669.70
	Great Britain		441	21.11
	France		220	10.55
Steam plows	Austria	8	65,697	7,743.22
	Great Britain	6	117,505	13,849.50
	Germany	2	26,897	3,170.00
Parts of steam plows	Great Britain		236,774	22,020.20
	Austria		104,718	9,738.90
	Germany		6,613	615.00
Harrows, iron and wood (with iron teeth), and parts of.	Austria		126,984	9,354.90
	Great Britain		11,023	710.00
	United States		1,322	85.25
Chaff cutters	Austria	7,551	1,987,667	106,154.38
	Germany	18	9,259	494.50
	United States	1	220	11.77
Parts of chaff cutters	Austria		167,329	11,555.77
	Germany		661	45 67
	United States		661	45.67
Beet cutters	Austria	1,377	232,805	12,862.00
	Germany	11	4,850	267.96
Parts of beet cutters	Austria		26,234	1,690.00
	Germany		1,763	113.68
Corn crumbers	Austria	647	166,226	10,704.34
	Germany	4	1,102	71.05
Parts of corn crumbers	Austria		7,936	548.10
Presses (hay, straw, and flax)	Austria	148	513,671	33,109.30
	Germany	8	91,790	5,897.15
	Italy	1	5,953	383.67
Parts of presses	Austria		11,023	2,273.60
Other agricultural machinery and parts of	Austria		900,090	66,746.40
	Germany		96,341	8,871.10
	United States		26,234	1,811.78
	Sweden		22,148	2,415.00
	Great Britain		2,204	203.00
	France		661	60.90
Hand machines and parts of	Austria		485,769	121,706.62
	France		26,148	7,299.88
	Italy		1,322	427.80
	Germany		1,102	314.65
	United States		1,102	203.00
Farm wagons	Austria	74		13,369.58
	Germany	3		542.01
	Roumania	2		361.34
Hoes, spades, and shovels	Austria		703,208	83,420.00
	Germany		16,093	918.74
	Great Britain		6,834	390.17
	United States		2,866	163.62
	Bosnia		220	12.95
Scythes and sickles	Austria		132,437	171,422.15
	Germany		440	57 25
	Great Britain		440	57.25
Axes (pole, pick, and axes)	Austria		110,803	63,257.24
	Germany		4,629	264.31
	Great Britain		2,865	163.62
	Bosnia		220	12.59

BELGIUM.

(*From United States Consul-General Lincoln, Antwerp, Belgium.*)

HAND LABOR VS. MACHINERY.

While the cost of labor in this district is still low in comparison with various other countries, it has sufficiently increased within the last ten years to justify the use of labor-saving machinery by both the agricultural and manufacturing interests.

IMPLEMENTS IN USE.

Modern agricultural implements used in preparing the soil, sowing or planting the seed, cultivating during growth, and harvesting or gathering of crops are now being used wherever the methods of cultivation and condition of soil will allow. In proportion to other countries the use of these implements in Belgium is still very limited, but at the same time it can be said that sales are increasing. Haymaking and harvesting machinery is mostly imported from the United States, but English and a few German makers have a fair share of those imports. Thrashing machinery is made in Belgium, but large outfits are also imported from England and Germany.

AMERICAN IMPLEMENTS.

American plows are finding a very limited market here because the Belgian farmer prefers the "Brabant" turn plow, which some, even experts, say is one of the world's very best plows. It is meeting with favor in every other European country. Spring-toothed harrows and cultivators to a limited extent are imported from the United States. Chaff cutters and food-preparing machinery are produced in Belgium, but are imported from England, France, and Germany. Windmills for pumping purposes are also imported from the United States.

There would be a much greater sale for American agricultural machinery in Belgium were the farms of greater extent and importance, as in France; the small area, however, and the unenterprising character of the Belgian peasant is a serious hindrance to the introduction of such machinery in this district.

ROADS AND VEHICLES.

The King Spring Company has been pushing the sale of American carts and buggies since 1896 with some success. The carriage makers, who are generally personal friends of their customers, are not inclined to let American carriages come into Belgium, hence they do all they can to prevent the sale of these carriages. However, they have succeeded in introducing about 200 vehicles within the last six years, and the majority of them have given satisfaction, although the roads are paved with large and uneven stones throughout two-thirds of the country. The American styles of vehicles are not liked here, and outside of a few dozen road carts and runabout wagons no big business can be expected unless the carriage bodies are made to suit the European ideas. Full-platform vehicles are the only ones likely to have any success, because a great many streets are too narrow to turn even with the half cut-under gears. Manufacturers who wish to export carriages in Belgium must make heavier axles and heavier wheels. These must measure at least 33 millimeters (1.3 inches) across the steel tire. Nearly all the street cars in the largest cities are run by electricity, many lines using the underground-wire traction, and wheels with a tread narrower than 33 millimeters get between the rails up to the hub. Cheap carriages will sell better than high-grade vehicles.

HOW TO INCREASE AMERICAN TRADE.

Experience has shown that it is impossible to introduce American goods by means of commercial literature, to which the Belgian buyer pays absolutely no attention, and which, as a rule, discredits the goods it is intended to advertise and commend. To succeed in placing goods on the market, it is essential to have them presented by a competent salesman acquainted with the language of the country in which he travels. It is also necessary to be ready to adapt the article offered to the requirements of the purchasers, and not to attempt to force upon them an article which, while it may meet with the approval of the American buyer, may require certain modifications in order to satisfy the particular wants of the locality where it is offered for sale. As testimonials from buyers at home carry no weight whatever on the Continent, inasmuch as buyers here will only listen to certificates of approval from customers in their own country, it is desirable that machines should be placed on trial and recommendations obtained from the foreign buyers. Only one further suggestion occurs to me: If our manufacturing associations deem the matter of sufficient importance, it would be a good idea to adopt the system which English manufacturers have pursued for many years past in some parts of the Continent in establishing warehouses for the exhibit of agricultural machinery and also to let the same on trial, as well as accepting payment on the installment plan.

DEALERS.

The only importer of American agricultural machinery in this country known to me is George W. Sillcox, 73 Rue de Lacken, Brussels, and the only importer of American vehicles is the King Spring Company, 57 Boulevard Anspach, in the same city.

DUTIES.

The duty on agricultural machinery is paid, per 100 kilograms (220 pounds), according to the predominating material of its construction, viz: Cast iron, 2 francs (38.6 cents); steel, 4 francs (77.2 cents); wood, 10 per cent ad valorem. The duty on carriages of all kinds is 12 per cent ad valorem.

GEO. F. LINCOLN,
Consul-General.

ANTWERP, BELGIUM, *May 15, 1903.*

FRANCE.

(From United States Consul Haynes, Rouen, France.)

AMERICAN VS. FRENCH AGRICULTURAL IMPLEMENTS.

While the trade in American implements in France is fairly large and steadily growing, it is not as large as it might be were certain conditions, now seemingly overlooked, fulfilled. Undoubtedly the American manufacturer has put forth efforts in this direction, but probably no field is more "ripe unto the harvest."

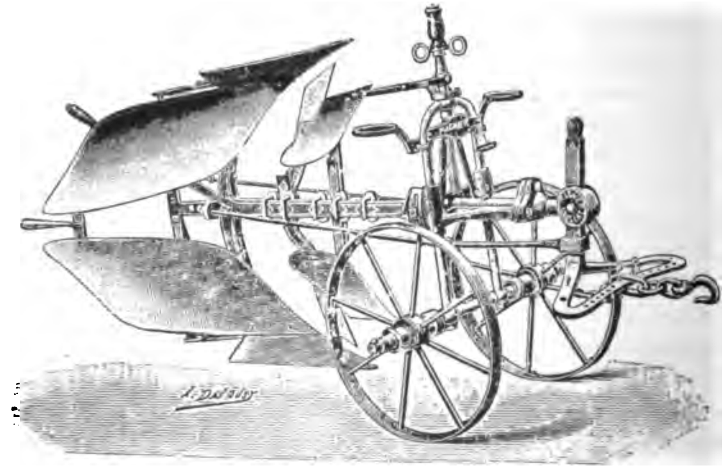

Fig. 1.*—The most common type of French plow.

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* These 15 illustrations are accompaniments to Consul Haynes' (Rouen) report. Fig. 12 not being referred to in report is omitted.

HOW TO INCREASE AMERICAN TRADE.

More American plows will come this way when the French farmer is thoroughly convinced that a single plow, always put to the left of a row in going and to the right in coming, is much easier both for man and horse than the heavy, unwieldy, double moldboard and double right-and-left-hand plow that necessitates turning down at the end of every row, presumably for no other reason than that one row must be finished before another is begun (fig. 1). If this were fully demonstrated to the French farmer he would have no alternative but to buy. This is is only one instance. Many farming tools are unsold here because the agriculturists of this country do not know their use. If the American manufacturer, instead of turning his implements over to some French agent, would take the business in his own hands and demonstrate the use, ease of manipulation, economy, and superiority of his machines upon the farmer's own land and before the farmer's own eyes, the comparatively antiquated French implements would ultimately be entirely replaced; but it is too much to expect the French agent, a manufacturer himself, to insist upon the merits of the American make to the detriment of his own. With the exception of the very few manufacturers who have entered the market and pushed their goods, the article from abroad sells itself.

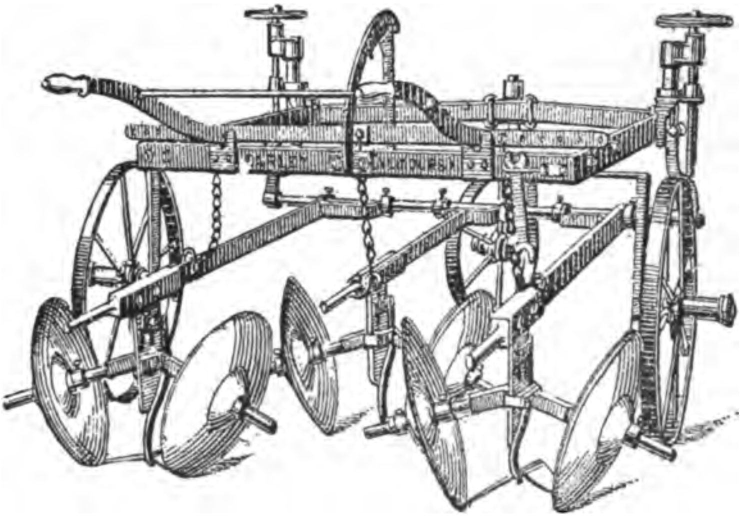

Fig. 2.—A new machine for the cultivation of beets.

FRENCH AGRICULTURAL IMPLEMENTS.

Beet cultivators.—At the French agricultural exposition held in Paris last month there was exhibited a new up-to-date machine for the cultivation of beets (fig. 2), which was nothing more than a disk cultivator with six concave disks. These disks, independent of each other, could be changed for rows from 16 to 28 inches apart. The perpendicular arms, to which the disks, working on bias, were affixed by means of vertical axles, could be slipped along the horizontal bars for a distance of from 12 to 26 inches. All were attached to a rectangular frame supported by three wheels. Two screws arranged in the frame regulated the raising and lowering of the horizontal bars. This machine required, or at least the cut advertising it displayed, one man walking behind to guide it and another in front to lead the horse. The three chief points claimed were: (1) It gave a more thorough and deeper work, the disks being placed at the extremity of long, horizontal levers; (2) the rotative disks never clogged and allowed the closest possible working of the plant without covering it with earth; and (3) it was capable with one horse of giving all necessary cleaning and airing of the earth, according to the kind and size of the plant and the nature of the soil. The price was $82. This machine is said in France to be something entirely new, and yet the disks can not be replaced by shovels, or spiders, or levelers, or harrow attachments; there is no adjustable spring lift nor scrapers to clean the disks; neither are the handles adjustable in height. For about half the price, riding, two-horse disk cultivators, with all attachments, are sold in the United States.

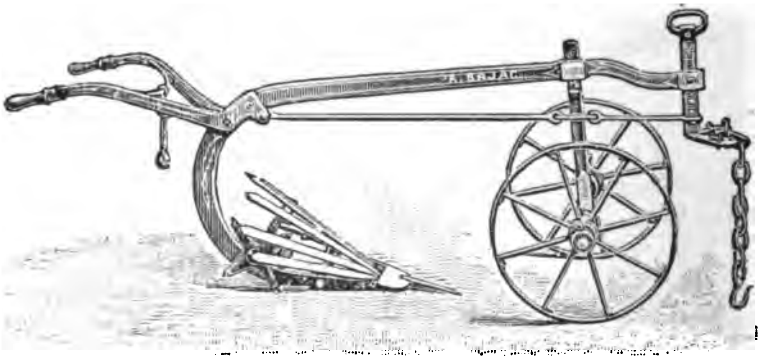

Fig. 3.—Potato digger.

Potato diggers and plows.—Potato diggers (fig. 3) are sold for from $25 to $40; yet these diggers are clumsy, have no gauge wheel, nor revolving fender, nor shaker movement, as the latest American makes have, and which sell from $16 to $20. One idea in this connection has perhaps escaped our manufacturers, but the French have already put it into practice, and that is to use the frame or stock (it can hardly be given the latter name in this country, however) of the beet plow for the potato plow or digger, simply changing attachments. Here the wheels of the frame also are changed, as the wheels for potato digging are too light for beet digging. This necessity would be obviated in applying the idea to the American stock, as the stock of the potato-digging plow could easily be that of the beet plow, and thus only the attachments would need changing. Some manufacturers here even use the same frame for potato planting and fallow and ridge plowing as for potato and beet digging. Beet-root-digging plows for one row sell for $30, for two rows $60, and for three rows $80.

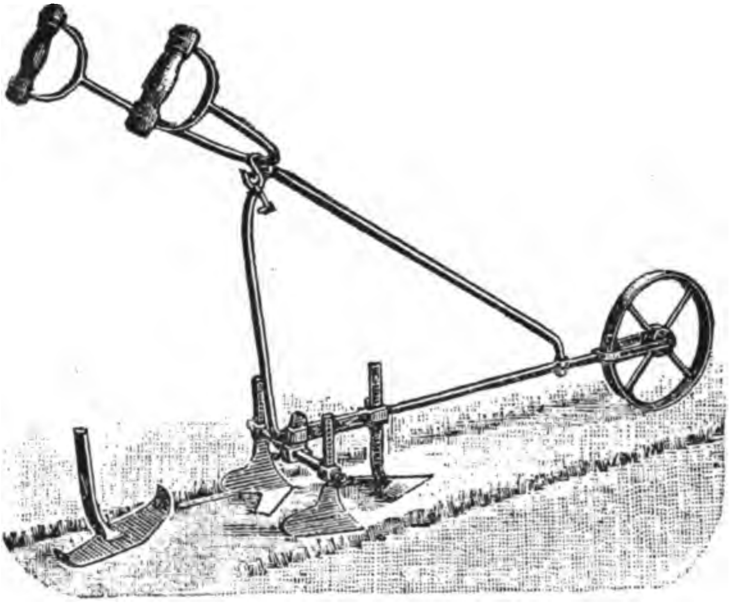

Fig. 4.—Garden plow.

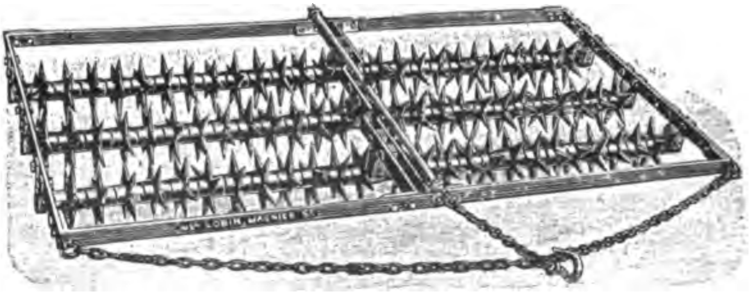

Fig. 5.—Harrow with star-spiked revolving rods.

Garden plows.—Undoubtedly the French garden plow, though perhaps a little more complicated than the larger-wheeled American make, is easier of operation and as useful. The one shown in the cut (fig. 4) sells for $6.

Harrows.—The French harrow is much more varied in kinds than the American. The American consists of straight spikes, turning at any desired angle, or of disks, while the French consists of revolving spiked stars or long, revolving, densely spiked rods (fig. 5), or of chains, supporting triangular teeth arranged zigzag (fig. 6), or of flexible or spring teeth (fig. 7). Often the harrow is attached to a frame supported by four wheels some 12 inches above the ground These wheels serve to carry the implement to and from the field, and when the harrow is inverted ready for work they act as ballast.

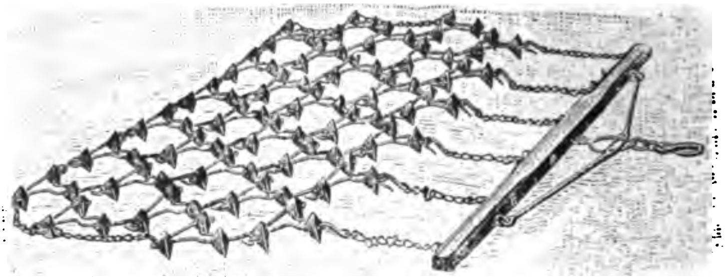

Fig. 6.—Chain harrow.

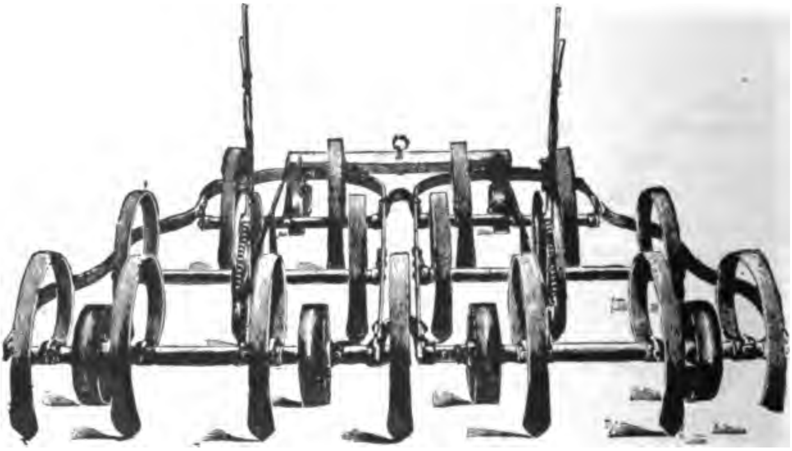

Fig. 7.—Harrow with flexible teeth.

The chain harrow—shown in fig. 6—2 yards square, weighing 155 pounds, for one horse, sells for $16; for two horses, 9 feet square, $25; and for three horses, 11 feet square, weighing 400 pounds, $30. The same sizes are also manufactured lighter in weight and cheaper. The same sized harrow, with revolving spiked rods mounted upon wheels, sells for double the price. Undoubtedly, in some respects,

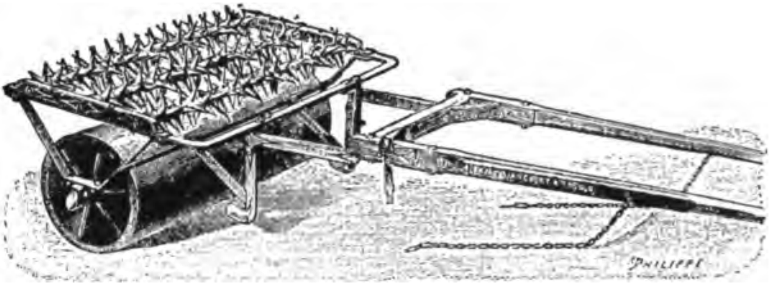

Fig. 8.—A one-horse harrow and roller combined

the French harrow has its advantages. There are no spading or dike harrows of French make, nor, so far as I know, seeder attachments for harrows. An ingenious contrivance in this country is the combined roller and harrow for one horse (fig. 8). These act reciprocally as ballast, one for the other. There is also a hand machine of the same kind.

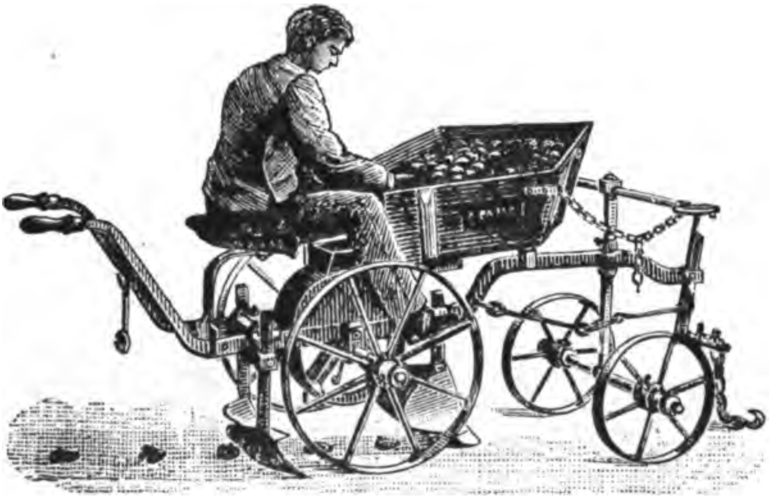

Fig. 9. -Potato planter.

Potato planters.—Potato planters which can, by transformation, be made a "horse hoe," or a potato digger, or a plow, are very costly. The one shown in fig. 9 sells for $100; without transformation, $70.

Horse hoes.—The horse hoe, which in some respects performs about the same work as the American walking cultivator, is often an ungainly affair (figs. 10 and 11). It is employed for weeding beets, potatoes, beans, vines, etc. This hoe sells for from $20 to $40.

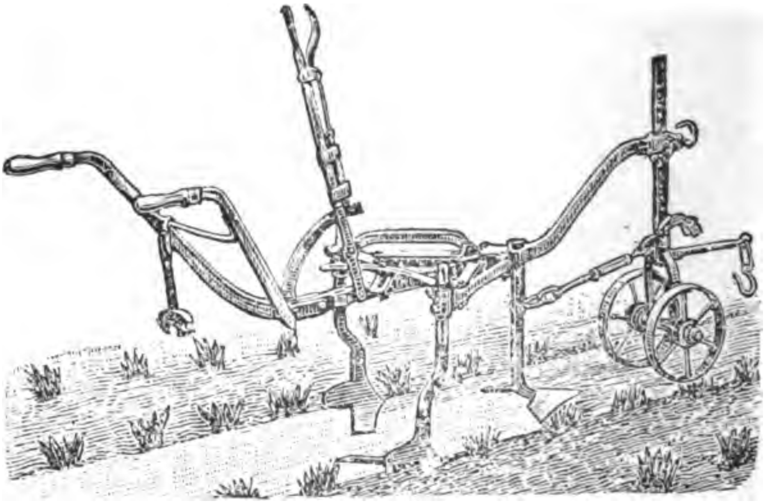

Fig. 10.—A "horse hoe," or cultivator.

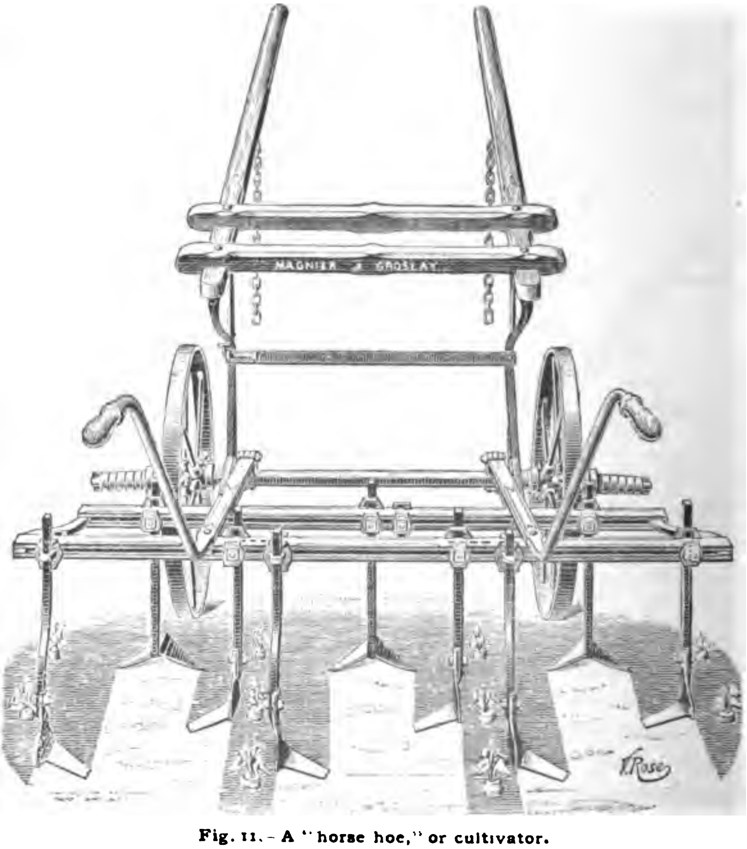

Fig. 11.—A "horse hoe," or cultivator.

Harness.—The harness gearing in France is somewhat more complicated than in America. Cuts are herewith shown indicating the manner in which one, two, three, and four horses are harnessed (figs. 13, 14, 15, and 16).

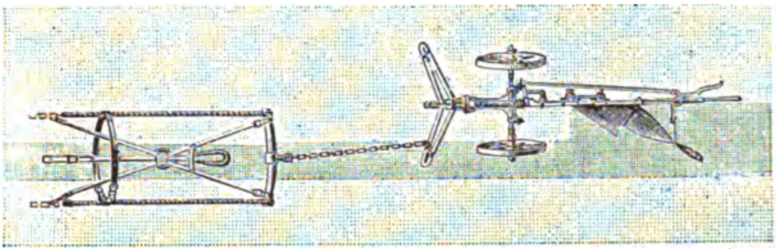

Fig. 13.—The harnessing of one horse.

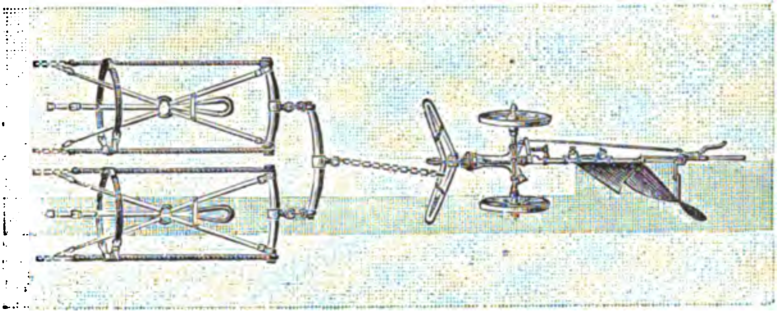

Fig. 14.—The harnessing of two horses.

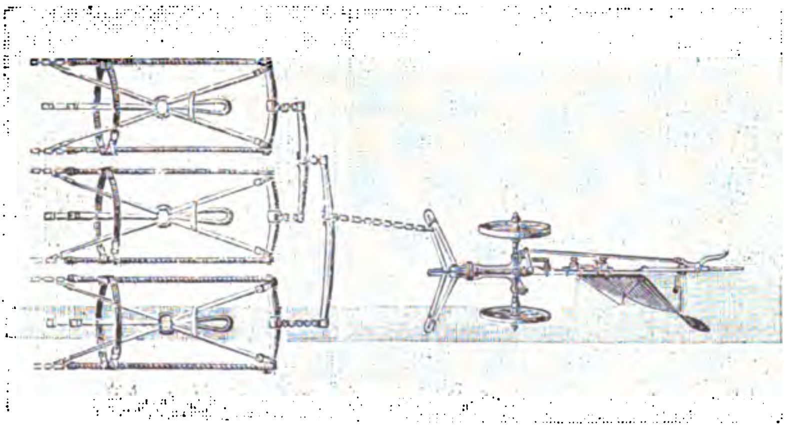

Fig. 15.—The harnessing of three horses.

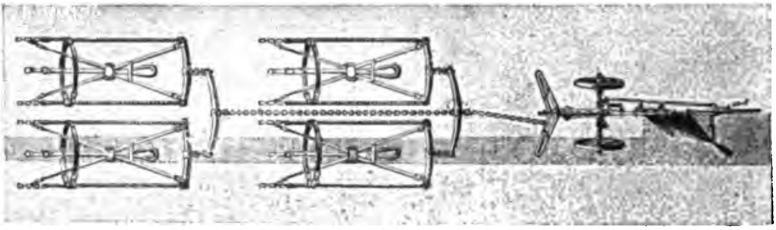

Fig. 16.—The harnessing of four horses.

REQUIREMENTS OF THE FRENCH FARMER.

It must be borne in mind that the French farmer is perhaps the most economical farmer in the world. His constant endeavor is to cause "two blades of grass to grow where before there grew but one." He farms strictly intensively and what he wants and must have is economy of work; thrashers that will save every grain; harvesters that will cut every stalk, and cut it low; cultivators that work thoroughly, never injuring a plant; planters that will never skip a hill—this is the first point, after which comes quickness and then cheapness.

THORNWELL HAYNES, *Consul.*

ROUEN, FRANCE, *April 25, 1903.*

FRANCE.

(From United States Consul Thackara, Havre, France.)

HAND LABOR VS. MACHINERY.

Modern labor-saving agricultural implements are extensively used in those districts of France where the conditions are favorable. In some of the regions grain and forage are grown on land so steep that only hand labor can be used in preparing the soil, sowing or planting the seed, cultivating during growth, and harvesting or gathering the crops. In other parts of France the farms are divided up into small parcels which, in many instances, are surrounded by hedges, so that the use of mowers, reapers and binders, etc., would be neither practicable nor economical. It can be stated, however, that, notwithstanding the comparatively low cost of farm labor in France, the trade in modern farming machinery is annually increasing. The importations for consumption in France have risen nearly 60 per cent in the last five years.

IMPLEMENTS IN USE.

The French are a conservative people, especially the farming class, and are slow to change their customs. It was long before the French farmer could be convinced that by the use of up-to-date methods of tilling the soil and harvesting the crops the products of his land could be materially increased. This change of ideas, in a great measure, is being accomplished by the excellent educational work of the French agricultural schools and by the practical demonstrations of modern farming made in the national and departmental farms.

AMERICAN IMPLEMENTS IN USE.

There is probably no American industry better exploited abroad than that of agricultural implements and machinery. As a consequence there is an important foreign trade in these products. Of the $18,000,000 worth of farming implements exported from the United States in 1902, $9,125,000 were sent to Europe. Of these, $2,000,000 were received in France.

German and English machines are used, as are also those of French manufacture; but the American machines hold the field because they are greatly appreciated by the French farmer on account of their efficiency, their lightness, and their reasonable cost.

HOW TO INCREASE AMERICAN TRADE.

Any American manufacturer of agricultural machinery who desires to create a new outlet for the sale of his products in France will find that his strongest competitors will be his own countrymen. All the large companies doing business with this country, as the McCormick, Deering, W. A. Wood, Osborne, Johnston, Adriance Platt & Co., etc., have their principal agents in Paris and their subagents in all of the important agricultural districts. Their goods are well advertised. It is seldom that one does not see in the hotels, cafés, etc., in the farming regions colored lithographs of American mowers, reapers and binders, hayrakes, etc., setting forth where the machines may be seen and where prices and other particulars may be obtained.

A manufacturer who is really serious in his intention to open up a trade in agricultural machinery in France must realize at the outset that it can not be done without the display of the soundest business sense and by the expenditure of time and money. Unless he makes himself thoroughly conversant with the conditions prevailing in this country as to the character of the ground to be tilled, the local difficulties to be overcome, the nature of the crops to be gathered, the business methods of the country, the standing and capacity of his foreign agents and subagents, and the kind of goods which are being sold by his competitors, he can not hope to succeed and had much better content himself with his home market.

It may be considered an axiom that new trade with non-English-speaking countries can not be established by correspondence in

English or by sending catalogues with prices, weights, and measures in that language. . The French farmer is already too familiar with well-arranged catalogues of farming implements printed in his own language to bother with those he can not read or understand.

In a country which, in 1901, had 35,500,000 acres of wheat and other cereals and 28,500,000 acres of grass and other forage under cultivation, whose grain crop was valued at $575,000,000 and the other crops at $581,000,000, there must be a favorable field for the sale of agricultural machinery. My advice to a manufacturer who desires to open up a trade in France in these products is either to come to this country himself or to send a capable representative. One speaking French would be better, but it is not essential. First visit Paris and study carefully the situation in that city, and then go to the principal cities of the Departments in which the agricultural centers are located. In the following table is given a list of the principal agricultural Departments of France and their chief cities:

Department.	Chief city.	Department.	Chief city.
Ain	Bourg.	Loiret	Orleans.
Aisne	Laon.	Lot	Cahors.
Allier	Moulins.	Lot et Garonne	Agen.
Charente	Angoulême.	Maine et Loire	Angers.
Charente Inférieure	La Rochelle.	Marne	Chalons sur Marne.
Cher	Bourges.	Mayenne	Laval.
Eure	Evreux.	Meuse	Bar le Duc.
Eure et Loire	Chatres.	Nord	Lille.
Gers	Auche.	Oise	Beauvais.
Haute Garonne	Toulouse.	Pas de Calais	Arras.
Ille et Vilaine	Rennes.	Saône et Loire	Macon.
Indre	Chateauroux.	Seine Inférieure	Rouen.
Indre et Loire	Tours.	Seine et Marne	Melun.
Isère	Grenoble.	Sevres (Deux)	Niort.
Loire Inférieure	Nantes.	Somme	Amiens.
Loire	St. Etienne.	Vienne	Poitiers.
Loir et Cher	Blois.	Yonne	Auxerre.

One can gain more valuable information by talking directly with the merchants engaged in the farming-implement trade than from a consular report or from correspondence at long range. In the Bottin, the business directory of France, he can get the names of the merchants engaged in the agricultural-implement trade, and in those cities where our consuls and consular agents reside he will undoubtedly have the benefit of their aid and advice.

After having obtained a knowledge of the situation, he will then be able to determine whether the conditions are favorable for creating an outlet in France for the sale of his manufactures.

DUTIES.

The United States not having a commercial treaty with France, American agricultural implements pay the maximum tariff of 15 francs ($2.90) per 100 kilograms (220.46 pounds) net, if imported direct from the United States; if imported via another European country, the duty is 18.60 francs ($3.59) per 100 kilograms. The minimum tariff is 9 francs ($1.74) per 100 kilograms.

FREIGHT RATES.

The rates of freight from New York to Havre, on the cargo boats of the French Line of steamers, are from $2.15 to $2.50 plus 5 per cent per ton, and on the regular steamers a minimum rate of $3.20 per ton is charged.

VEHICLES AND WAGONS.

There are no available statistics which would indicate the extent of the vehicle industry of France; but it may be assumed that it is an important one, judging from the number of firms and companies engaged in the sale and manufacture of carriages of all kinds. In Paris alone, which is the center of the industry, there are 247 carriage makers of sufficient importance to be mentioned in the city business directory. In many of the large provincial cities there are also vehicle manufacturers and dealers, while in nearly every village, especially where wood is abundant, there are wheelwright shops in which are made the farm wagons and two-wheeled carts so much in use in France.

It would seem that the native production is equal to the demands for local consumption, as the official customs statistics indicate that the value of the importations of carriages, business and farm wagons, etc., in 1902 for use in France was only $154,411. This amount does not include railway and trolley cars, automobiles, bicycles, and parts of same. The value of the exportations of French manufacture during the same period was $977,352.

In conversation with several of the local carriage makers and with others who are in a position to know, I was informed that there never has been a systematic effort to introduce American-made carriages, carts, farm wagons, etc., into this part of France. There are a few American carriages to be seen, but they were imported for personal use by Americans or by Frenchmen who had visited the United States and were attracted by the style, lightness, and cheapness of our vehicles.

It would be difficult to persuade the French that American carriages, wagons, etc., although much lighter, less bulky, and more attractive in appearance than those of native manufacture, would be as efficient and as durable. In my opinion the experiment would be a doubtful one.

In a personal interview with Mr. F. Thibout, 29 Rue de Normandie, a carriage maker of Havre, he informed me that he would be pleased to receive a consignment of American vehicles provided it were made at the risk of the American exporter. He would do all in his power to make sales, and said he could see no reason why the carriages could not be sold, provided the prices were right and the styles were those which were in demand. I would, however, strongly advise a personal visit of the American manufacturer to this country before making a trial exportation.

The duties on vehicles imported from the United States into France direct are as follows: Carriages weighing 125 kilograms (275 pounds) or over, 60 francs ($11.58) per 100 kilograms (220.46 pounds) net; carriages weighing less than 275 pounds, 150 francs ($28.95) per 100 kilograms net; business and farm wagons on springs, 15 francs ($2.90) per 100 kilograms net; same, without springs, 8 francs ($1.54) per 100 kilograms gross weight. If the above are imported into France via another European country they will have to pay a surtax of 3.60 francs (69 cents) per 100 kilograms.

To the would-be exporter of American vehicles I would offer the same advice as given under the heading "agricultural implements."

A. M. THACKARA, *Consul.*

HAVRE, FRANCE, *July 16, 1903.*

GERMANY.

(From United States Consul-General Mason, Berlin, Germany.)

The following report applies especially to the consular district of Berlin, and in a general way to all Germany.

HAND LABOR VS. MACHINERY.

The cost of hand labor is sufficiently great to justify the use of labor-saving machinery by the agricultural and manufacturing interests, but not to the same extent as in the United States. Hand labor is generally much less expensive in Germany than in the United States, but it is also less effective—that is, a laborer of almost any class does less work in a day than a worker of the same grade in the United States; but there has been in Germany during the past ten years a notable migration of laboring people from the remoter rural districts to the cities and manufacturing towns, and this in addition to the steady though diminished drain of emigration renders male agricultural labor scarce at certain seasons of the year. The use of machinery is therefore constrained by both economy and improved methods of cultivation, and is steadily extending and becoming more general throughout the Empire.

AGRICULTURAL IMPLEMENTS IN USE.

There are many farms in Germany where plowing, thrashing, and the cutting of straw and grinding of grain for feed are done by steam power; where the harvesting of grain and hay, the drilling of wheat and rye, the cultivation of root crops, and the digging of potatoes are all done by machinery as highly improved and effective as that used for the same purposes in the United States. These conditions prevail, of course, only on large estates, owned and managed by the most wealthy and progressive class of agriculturists. A large percentage of the arable land of Germany is divided into small farms, where plowing as now done is no deeper or better than thirty years ago, and where grass is cut with scythes and wheat and rye either cradled or reaped by women with hand sickles. Sugar-beet cultivation lends itself only in a limited degree to cultivation by machinery; the important operations of thinning out, topping, and gathering are done, thus far, by hand. For these purposes female labor is chiefly employed, the labor being done by peasant women, who come in large numbers from Poland, Galicia, and eastern Silesia to the sugar districts of central Germany, where they work during the summer in gangs, under a male overseer. Their earnings are about 1.50 marks (35 cents), with food and lodging, per day, but in early June and at harvest time there is sometimes an urgent demand for labor, which raises wages slightly above that figure.

The plows, harrows, cultivators, drilling, thrashing, and potato-digging and feed-cutting machinery used in Germany are principally made in the country. In the standard industrial directory of the German Empire are recorded 590 manufacturers of agricultural tools, implements, and machinery. Some of these—for instance, Heinrich Lanz, of Mannheim; Gross & Co., of Leipzig; Friedrich Krupp-Grusonwerke, of Magdeburg; F. Zimmermann & Co., of Halle, and numerous others—are firms and companies of large resources and extensive manufacturing facilities, which turn out excellent machinery, modeled largely after American patterns, at prices with which it is difficult for imported machinery to compete. John Fowler & Co., an English firm with factories at Buckau, near Magdeburg, are the principal makers of highly improved steel plows. H. F. Eckert Company and A. Borsig, of Tegel, are large builders of steam plows, locomobiles, etc., in which they have an important export trade to Russia and Argentina.

AMERICAN AGRICULTURAL IMPLEMENTS AND VEHICLES.

McCormick's reaping and mowing machinery and horserakes are largely sold and highly appreciated throughout Germany. That company began early and in the right way, by establishing a depot in this country and sending its own men to control and manage the business. They have a central office at Berlin to manage their German trade and another at Hamburg to receive and forward machinery, parts, etc., to the Berlin office and to other European countries. A few American cultivators, tedders, and disk harrows are sold over here; also a very few American buggies, but no farm wagons. American hay and manure forks are still sold to some extent in this country, but not so largely as formerly, for the reason that they are closely and successfully imitated by German makers, who import white-ash handles from the United States for that purpose.

American agricultural tools and implements, so far as known and used here, are popular, but they have been extensively copied when not protected by patents, and the German-made articles, not having paid sea freight or duty, are usually cheaper than the same thing from the United States.

Germany grows from 35,000,000 to 48,000,000 tons of potatoes annually. The work of harvesting this immense crop comes in the cold, wet days of October, November, and as late as December. Until quite recently this work has been done by hand, but of late years several more or less successful potato-digging machines have been tried, and the tendency is strongly toward the use of such machinery. If there is a really successful potato digger in the United States, that is simple, durable, and can be sold for a reasonable price, the maker of such machine should send over several sample machines in charge of a competent, German-speaking operator, who can show it in operation, explain its working, and make contracts with one or more firms to handle it for the German trade.

HOW TO INCREASE AMERICAN TRADE.

It will also be essential that the American manufacturer who tries to open a market here for anything shall be prepared to make sales on the terms which are readily granted by manufacturers in the same lines in England, France, and Belgium who cater to the German market. No claim of superiority, however loudly or eloquently made, will induce German firms to buy a new tool or machine in the United States, pay for it on delivery at seaport, and import it here at their own risk and expense. It is perfectly easy for any American who wishes to ascertain the financial standing of a firm or dealer in Germany to find out all that he needs to know through the standard mercantile agencies established for that purpose. Consular officers are very properly prohibited by regulations from giving to private inquirers their opinions on that class of subjects. Having ascertained that a firm or company is honest and responsible, the American exporter should be ready to grant the credits that are customary in such trade in this country. The stronghold of Great Britain on the trade of the world is through her banking facilities in foreign countries and the facilities thus provided for granting credits. The want of such equipment and a willingness to learn and comply with foreign trade customs and conditions is the heaviest handicap which most Americans carry in their quest for foreign trade.

Trade in American machines can not be increased by writing letters or sending catalogues. The only chance for any important increase is in the case of a really superior new machine or implement, something better or cheaper, or both, than what is used here for the same purpose. It should be brought over here by an expert salesman understanding and speaking German, shown to dealers and exhibited at country fairs, explained and displayed in operation if possible. The Superior Drill Company, of Springfield, Ohio, is at present furnishing an object lesson of the right way to introduce a deserving agricultural implement. That company makes an improved grain drill for planting wheat, rye, and other cereals. It has been exhibiting its machine over here at fairs and local mechanical exhibitions, it has been shown in operation and its merits thus made known, until from all accounts it has become well established and will no doubt build up a successful trade. Large firms, like the McCormick and other companies who sell such machinery, appoint reliable and well-established firms in the leading cities as local agents, and give to each a prescribed district or territory within which sales may be made.

Moreover, American agricultural machines often need to be modified to meet foreign conditions. The ordinary American hay tedder, for example, will not work satisfactorily in the short, fine grass of Germany, and some of the leading makers have altered their machines made for export to meet this requirement.

DEALERS IN AGRICULTURAL IMPLEMENTS.

Some of the leading houses who might be interested in promoting the importation of American agricultural machinery to Germany are Messrs. Max Paulsen & Co., Hamburg; Grell & Co., Hamburg; H. F. Eckert Company, Berlin; Gross & Co., Leipzig; and Hodam & Ressler, Danzig. The secretary of the American Chamber of Commerce, No. 59 Friedrich-Strasse, Berlin, is in a position to make connections for American exporters who desire to extend their trade in this country, and will gladly use his best efforts do so.

DUTIES.

The duties assessed upon agricultural implements and machinery imported to Germany depend upon the material chiefly used in its construction and upon the degree of finish to which it has been subjected. The schedule is as follows, it being premised that when any article is composed of two or more materials which can not be or are not taken apart and imported separately, the duty is levied at the rate specified for the material of highest dutiable grade and per 100 kilograms (220.46 pounds):

	Marks.
Cast-iron manufactures	3=$0.71
Iron:	
Wrought	5= 1.19
Malleable	6= 1.42
Painted or varnished steel	10= 2.38
Steel edge tools, etc	15= 3.57
Wood, painted or varnished	5= 1.19

CATALOGUES.

The illustrated catalogues of Mr. Heinrich Lanz, of Mannheim, and K. Martin, of Offenburg, are submitted to indicate the general character of their products. On April 18 last I sent to Hon. J. H. Brigham, Assistant Secretary of Agriculture, at his request, a large collection of the catalogues of German makers of agricultural implements and machinery, to which I venture now to refer, as the collection then sent can not be duplicated.*

FRANK H. MASON,
Consul-General.

BERLIN, GERMANY, *July 25, 1903.*

GREECE.

(From United States Consul McGinley, Athens, Greece.)

HAND LABOR VS. MACHINERY.

The cost of hand labor in this district is very cheap, but in some portions of it considerable labor-saving machinery is used by both agricultural and manufacturing interests. It is not, however, used to the extent required in other European countries. Manufacturers find that better goods and articles can be produced by machinery than by hand; hence the use of machinery is becoming more extensive in the manufacturing districts, although hand labor does not increase in value. As an example, in my report on the "Clayworking industries of Greece" of December 28, 1901, it was stated that all the pottery and tiles then manufactured in Greece were made by hand. Within the last few weeks a steam-power factory, fitted with machinery of the latest designs, began the manufacture of pottery and tiles at Koroni, Greece.

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* The illustrated catalogue of Heinrich Lanz is filed in the Bureau of Statistics, where it may be seen by persons interested; the other catalogues are, as stated, in the Department of Agriculture.

In the valleys of southern Greece the tracts of land cultivated by each peasant or farmer is so small and labor is so plentiful and cheap that no labor-saving machinery is used; but in Thessaly agricultural pursuits are far more extensively followed, laborers are scarcer than in southern Greece, and labor-saving machienery—such as harvesters, mowers, horserakes, thrashing machines, etc.—is used to some extent.

I regret very much that I have not the spare time to make a tour of Thessaly and study the agricultural conditions there before making this report, as I have had many years' experience as an agriculturist in the United States. Owing to the difficulties to be met with in traveling to the interior of that section of Greece, it is almost a closed book to the outside world, especially as regards its agricultural resources, facilities, and prospects. When the railroad now in course of construction between Athens and Larissa is completed it will be easier to reach the interior of Thessaly and we shall learn more about its resources.

AGRICULTURAL IMPLEMENTS IN USE.

In southern Greece many primitive agricultural implements are still in use, including plows similar to those used here in the age of Pericles—the pole, bent-bow hayrack, common in America in pioneer days; the old-time reaping hook; and handmade hoes and shovels, the hoes with blades as large and as heavy as the American spade. In the valleys of southern Greece the ground is plowed with modern plows of light and inferior patterns, or, as is the case near Megara, with the ancient form of plow drawn by oxen. This plow consists of a large pole reaching from the yoke of the oxen to several feet behind them, where it is fastened to rough wooden handles and to a piece of wood that extends downward and has a piece of iron or steel fastened to its lower end as a point. Most of these plows do not turn over the soil to one side, but scratch a furrow and throw it to both sides. Even with the modern plows used, the plowing in southern Greece is far from good. To use an agricultural term common in America, they simply "cut and cover," and seldom plow deep. I am told that the plows and plowing are much better in Thessaly.

Of late years the Greeks have been importing samples of agricultural implements and are trying to manufacture imitations, but of cheaper material, so as to sell the homemade product cheaper than the imported. Nearly all the agricultural implements in use in southern Greece are of home manufacture.

In Piræus, Volo, Argos, and other towns in this district are factories in which plows of different patterns, and in sufficient number to supply the home market, are manufactured. The make and prices of some of those homemade plows are as follows:

No. 1. Made with wooden beam and handles or all of iron, 24 okes (68.4 pounds), with extra point and harness (collar, hames, and rope traces) for the horses, 55 paper drachmas* ($6.60).

No. 2. Made with wooden beam and handles or all of iron, 20 to 22 okes (57 to 62.7 pounds), with extra point and harness for two horses, 55 paper drachmas ($6.60).

No. 3. Made with wooden beam and handles or all of iron, 18 okes (51.3 pounds); with extra point and harness for one horse, 45 paper drachmas ($5.40).

No. 4. A reversible plow, made with wooden beam and handles or all of iron, 18 to 20 okes (51.3 to 57 pounds), with extra point and harness for two horses, 65 paper drachmas ($7.80).

I have seen no light hoes here except for use in gardens. The heavy hoe in common use soon tires the strongest man, but the Greeks seem to prefer it to a lighter one, especially in the cultivation of grapevines. The shovels used are of the long-handled, oval-shaped variety. Have not seen any cultivators in use here, but am told they are used in Thessaly. The harrows used are of various patterns or designs.

Importers of such machinery have informed me that considerable modern and labor-saving agricultural machinery has been sent into Thessaly of late years, chiefly through its principal seaport, Volo, but that most of the last shipments to Volo still remain there unsold. It is stated by the importers that mowers, harvesters, thrashing machines, etc., have been sold in comparatively large numbers in Thessaly, but that the natives do not always know how to properly use and care for such machinery, and much of it is soon ruined and unfit for use on account of ill usage and neglect on the part of the owners or operators. Not knowing where the fault really lies, the farmers consider such ruined machinery to have been defective in make and refuse to purchase more of it, hence one cause for the present dullness in the agricultural-machinery market at Volo. Some of the dealers report that they find great difficulty in collecting the purchase price on agricultural machinery sold on credit or time payments to the farmers of Thessaly.

AMERICAN AGRICULTURAL MACHINES AND IMPLEMENTS.

American agricultural implements are sold and used in this district in limited numbers. Three years ago one of the leading American manufacturers of agricultural machinery introduced his harvesters into this district. They were, as far as I can learn, the first harvesters used in Greece, and large numbers were sold in Thessaly, as well as mowers, hayrakes, and other implements of

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* 1 paper drachma = 12 cents, at which rate the equivalents are given; 1 gold drachma = 19.3 cents.

American manufacture. Then a large consignment—nearly a steamship's cargo of American implements—was ordered for the Volo market. They reached there in due time, but a large part of the consignment still lies there unsold.

AGRICULTURAL VEHICLES.

No wagons or other vehicles for agricultural purposes are imported from the United States and very few from any country, the home manufacturers producing enough for the home demand. Only two kinds of vehicles are in favor in the agricultural districts—a heavy, two-wheeled cart for work on the farm and for carrying heavy loads to market and a lighter two-wheeled vehicle with springs under the body or box and sometimes covered by a canvas top. These spring carts are called "sustas," and are used for driving to the city or village, to church, and for all kinds of light and passenger traffic. The bodies of these carts and sustas are usually made of beech and the running gear of oak wood, but the axles of the sustas are now made of steel. The prices of the heavy carts are now from 360 to 500 paper drachmas ($43.20 to $60); sustas, without tops, 600 to 800 paper drachmas ($72 to $96); and with tops, 700 to 1,000 paper drachmas ($84 to $120).

HOW TO INTRODUCE AGRICULTURAL IMPLEMENTS.

The most effective means of introducing agricultural implements into this district and of increasing the trade therein is to send agents who have had long practical experience in using such articles as they may have for sale, so that they may instruct the purchasers how to properly use and care for such implements. It is very poor policy to send implements to agents here who know little or nothing about the use or care of such articles—who, in fact, may have never before seen such implements. Such an agent is sure to ruin the trade. One American firm sent their European agent here to introduce their machines and show the Greek agent how to operate them, a task which he accomplished, to his own satisfaction, within a few days. Anyone who has had practical experience in setting up and working such machines as harvesters knows that no novice can learn how to properly handle and care for them within such a short space of time. American manufacturers must send experienced men here and elsewhere if they would build up a good trade in agricultural implements.

NAMES OF DEALERS IN AGRICULTURAL IMPLEMENTS.

I give herewith names and addresses of Greek houses who would be most likely to be interested in promoting this business in this district:

Athens.—A. Tsakonas, 9, Odos Sophokles, and D. & C. Cosmis, Odos Athena.
Piræus.—Greek Machinery Company "Vassiliades," C. M. Chrisaphides, A. D. Zachariou & Co., and L. Angelopoulos.

TARIFF RATES.

Agricultural implements are admitted into Greece free of duty. The tariff on such vehicles as the agriculturists of Greece use is as follows: On heavy, two-wheeled carts or on a sustas, 20 gold drachmas ($3.96) each; on four-wheeled, heavy wagons, 40 gold drachmas ($7.72).

DANIEL E. MCGINLEY, *Consul.*

ATHENS, GREECE, *June 24, 1903.*

ITALY.

(*From United States Vice-Consul Smith, Milan, Italy.*)

AGRICULTURAL CONDITIONS.

It is considered that agriculture in Italy has need to be greatly ameliorated, and this will be brought about by radical reforms in the methods of cultivation and the augmentation of production. A means to this end would be a more extensive use of modern agricultural implements and machines, to take the place of the out-of-date and inefficient instruments which the large majority of agriculturalists still adopt.

AGRICULTURAL SOCIETIES.

The society which places on the market those types of machines and implements best suited for the various needs of the different conditions of the soil will get the best lasting results in the way of sales. In this connection, it is interesting to note that the Agricultural Society of Lombardy has decided to found and maintain in Milan a trial station for the testing of agricultural machines. Referring to this determination on the part of the above-named society, the Ufficial Bulletin of February 19, 1903, says:

> It is an institution which every country except our own has already. For a long time it has been wanted by our agriculturalists, who, ever increasing their use of agricultural machines, feel the need to be guided in their acquirements by that rigorous judgment which only such a trial station can furnish. Milan, which is the center of commerce also for agricultural implements, will be thus able to offer a home of study and research which will be most useful to national manufacturers.

Such an institution will also be useful in other ways, for it is certain that many farm hands have little practical knowledge of the machines intrusted to their care, so that such machines repeatedly have need of repair, and are sooner rendered inoperative for this want of knowledge. There are agricultural schools, societies, etc., in Italy and some of the most advanced, like the Cattedra Ambulante di Agricultura, of Milan, award prizes to those laborers who show most facility in handling the various machines at the trial operations.

Some agricultural societies, such as those of Parma, Piacenza, and Bergamo, acquire machines for the purpose of hiring them out to associates for testing purposes. Trials are thus made, and when a particular type of machine is approved by the user he is able to obtain a similar one from the same source which supplied the society, so that the results are practically assured.

HAND LABOR VS. MACHINERY.

As to the question of cost of hand labor, it might be said that in those districts where the agricultural population is not discontented with a low wage, and whence there is no great emigration, the prospect of placing agricultural machines is not very encouraging; but, on the other hand, in districts where many of the male population have emigrated to America, or more or less temporarily to France, Switzerland, and Germany, on account of the smallness of remuneration of manual labor at home, it is found that more sales are effected. This is accentuated, too, by the fact that during the busy season of agricultural labor outside hands must be necessarily employed who demand a wage so in excess of the local standard that landowners and farmers find it to their interest to be equipped with modern machinery. Strikes proved an incentive to sales, which in their turn had a similar effect on labor, as the acquisition on the part of employers of labor in rural districts of modern implements proved conducive, in many instances, to the return to work of numbers of strikers.

The continuous emigration has proved a factor in this particular industry, and the diminution of the male population in some districts by their seeking employment in the cities will increase the call for machinery.

The projects to reclaim vast tracts of land which have been lying idle for centuries, if realized, will also augment the demand.

IMPLEMENTS IN USE.

The old methods still serve so long as manual labor is cheap and sure, and are good enough for those who remain dubious as to the certainty of correspondingly better results or who regard the outlay risky, being incredulous as to any great ultimate advantage. To meet this, ways and means should be found to practically demonstrate under all sorts of conditions the practical utility, soil-improving, time-and-money saving properties of modern implements; very close attention being paid to put those machines on the market which will work successfully under the peculiar conditions and requirements of the different surfaces. To do this effectively a thorough knowledge of the different regions and exigencies of cultivation should be acquired by the supplier.

The best period of the year for sales of agricultural machinery is that of May and June. At this season many of the farm hands are occupied with silkworm breeding, rice plowing, and maize hoeing, so that mowers, tedders, and rakes are in request. The machines imported into this district, and throughout Italy generally, come from the United States, England, Germany, Hungary, and Switzerland.

As far as I can ascertain, by far the greatest number of plows and cultivators are imported from Germany, while about 90 per cent of imported harvesting machinery comes from the United States, England, Hungary, and Switzerland—Hungary, a newcomer in this market, being a strong competitor. American plows and drills are very well introduced, but in point of numbers do not compare with those of German make.

The German manufacturers have the advantage of being able to load machines on trucks at their own works, without the necessity of any special packing, thus saving both on freight and duty (not to mention their special railroad rates as far as the frontier), inasmuch as packing bears the same duty as the machines. This is a very considerable economy, as packing cases, etc., from the United States form from 20 to 30 per cent of the gross weight. For example, the net weight of a two-horse mower of a certain United States factory is 674 pounds and the gross weight 896 pounds, a difference of 222 pounds, so that 75 per cent is machinery and 25 per cent packing. As remarked before, duty is levied on the gross weight.

AMERICAN IMPLEMENTS.

American-made portable engines and thrashing machines have not met with the best success in Italy. They are considered complicated and not sufficiently economical. In this instance the English and Germans have given the matter more attention and study, and as a result have met with more success. From inquiries it seems that a good American cornsheller—not hand power—could find a ready market, and yet it has never been introduced. They are made in the country, but only to a limited extent and by no means in sufficient numbers to meet the home requirements. Another implement which is needed, but which has never yet been introduced, is a ditch-making machine. American hand hoes for the cultivation of beets are much appreciated; but at present the machinery used in the manufacture of beet sugar comes exclusively from Germany.

HOW TO INCREASE AMERICAN TRADE.

Those American manufacturers who have not yet introduced their specialties into this country should not lose time, as there is a home industry taking root which in course of time may affect the present import trade. It is well known that one of the large home works, at present engaged in building railroad locomotives, engines, and thrashers, will within the next year erect a special factory just outside this city (Milan) for the manufacture of plows, tedders, mowers, rakes, and other harvesting machinery. The house has already placed various samples of tedders and rakes on the market for trials and will soon be a serious competitor. These, however, will not be the first modern plows manufactured in Italy, as there already exists a factory at Sant'Angelo Lodigiano, in this district, which has been producing for the last year or so.

IMPORTS OF AGRICULTURAL IMPLEMENTS.

The following table of imports of all kinds of agricultural machinery will show the increase during the years given. The increase is given in weight only:

Year.	Quantity.	Year.	Quantity.
	Tons.		*Tons.*
1888	990	1896	1,625
1889	1,265	1897	2,545
1890	1,812	1898	2,535
1891	1,727	1899	3,861
1892	1,864	1900	4,063
1893	1,449	1901	4,321
1894	1,365	1902 (first three months)	2,760
1895	1,551	1901 (first three months)	2,037

It is stated that this particular increase of 723 tons between the three corresponding months above indicated was almost entirely due to the increase in use of harvesting machinery imported from the United States, while the general increase of late years is due to the augmentation of imports of German cultivators, etc. It is also stated that during the last twenty years there have been imported into Italy the following approximate numbers of agricultural machines: Plows, 40,000; drills, 8,000; mowers, 12,000 to 15,000; reapers, 2,000 to 3,000; tedders and rakes, 15,000 to 20,000. These figures appeared in a paper read before a congress of Italian agriculturists at Piacenza in September, 1902.

There are no statistics from which a concise statement as to number and kinds of agricultural machinery imported can be obtained. In the general statistics they are included with other classes of machinery and parts of machines. The agricultural implements which are imported from the United States are cleared at Genoa and those coming from northern Europe are cleared at the ports on the frontiers, such as Chiasso, Luino, and others, while some are shipped through and declared at Milan. The following will show, approximately, what were declared at Milan during the year 1902: From Austria and Hungary, 41 tons; France, 28 tons; Great Britain, 64 tons; and Switzerland, 49 tons. The quantity declared at Chiasso during the same period from the above and other countries not mentioned was 739 tons and at Luino 90 tons.

DUTIES.

The tariff on agricultural machinery of all kinds is 9 lire ($1.73) per quintal (220.46 pounds); on detached parts, 11 lire ($2.12) per quintal.

On the question of tariffs the following important point should be carefully noted by United States manufacturers and exporters: All plows sent without their relative wheels and all harrows of the ordinary drag type—that is to say, not disk or rotating harrows—do not figure under the tariff of agricultural machinery paying $1.73 per quintal, but are classed as instruments for arts and trades, paying the heavier duty of $2.79 per quintal. The American manufacturers who place goods in this market do so through their respective agents here. These agents usually insist on having the right of exclusive sales throughout the country.

DEALERS.

The names of agricultural societies and firms dealing in agricultural implements in Lombardy are as follows:

The Primo Sindacato Agrario Cooperativo di Milano, which has nine branches in nine of the provincial towns.
The Società Agraria di Lombardia.
The Federazione del Consorzi Agrari di Piacenza.
Baccolini, A. & C., Milano.
Colorniing, A. & C., Milano.
De Haan, W., Milano.
Della Valle & C., Milano.
Golaing & Conelli, Milano.
Guicciardi, U. & C., Milano.
Regie Ferriere dello Stato Ungherese, Milano.
Sessa, Tronaing & C., Milano.
Tosi Ettore, Milano.

ROADS, ANIMALS, AND VEHICLES.

The vehicle industry is among the oldest in Milan. At present there are a good number of builders and competition is very keen, the question of price being, as usual, of primary consideration. The more important concerns are supplied with some machinery, but still the greatest part of the work is done by hand labor. In the last few years several builders have put down electrically driven wood-sawing plants (German), but few of the many and varied machines used in the American carriage trade are found in local shops. When foreign ideas are adopted they are usually French, the light construction of the American trade not yet having found public favor. It is said that the roads in Italy, particularly the streets in some cities—as Milan, for instance—are not suitable for vehicles of light weight. It is not probable that there is much of an opening for any foreign make, as the market is well supplied by the home industry, which limits its output to only a few styles, invariably of the rougher class. There are some firms who build very light two-wheel vehicles, but such are made at Bologna and a few at Florence. There is also a small carriage export trade, a few vehicles being sent to Egypt and Switzerland. Some of the builders here have imported a few American vehicles, but they state that most of them remain unsold and they still have some on their hands. There are very few dealers, the trade being almost entirely in the hands of the builders, who frankly admit that it is not to their interest to push a foreign article. A firm here which deals in saddlery and carriage supplies does not find it convenient to keep American vehicles, except when held in deposit and sold on account of the foreign house. They say that to order a carriage in the United States takes too much time and that clients will not wait.

One or two houses import wood for wheels, for which there is an increasing demand, but it is not likely that they would wish to import the wheels on account of the various assortments which are asked for.

There are also one or two firms manufacturing motor cars, the bodies for same being made by local carriage builders.

The following statistics show the number of vehicles imported and exported for the periods between January 1 and October 31 of the years 1901 and 1902:

Description.	Imports.		Exports.	
	1901.	1902.	1901.	1902.
Vehicles of 2 wheels	28	26	57	65
Vehicles of more than 2 wheels and less than 5 springs	36	37	133	83
Vehicles of more than 2 wheels and more than 5 springs	1	2	2	9
Motor cars of more than 2 wheels and less than 5 springs	238	229	12	26
Motor cars of more than 2 wheels and more than 5 springs	2	5	3	…………

There were no imports or exports of vehicles in the white.

H. P. SMITH,
Vice-Consul, in Charge.

MILAN, ITALY, *August 7, 1903.*

NETHERLANDS.

(From United States Vice and Deputy Consul Vinke, Amsterdam, Netherlands.)

HAND LABOR VS. MACHINERY.

Though the cost of hand labor in this country is not so high as in the United States, the use of labor-saving machinery is justified, such machines being already to some extent in use.

IMPLEMENTS IN USE.

Modern agricultural implements, especially harvesting machinery, are used in this country; it is, however, impossible to state to what extent. Most of the agricultural implements in use are imported from Great Britain, with small quantities from Germany.

AMERICAN IMPLEMENTS.

American mowers and reapers are in general use, but the sale of other American agricultural implements, vehicles, and wagons is unimportant, they being considered too light for the soil and roads of this country.

HOW TO INCREASE AMERICAN TRADE.

The best method of introducing or increasing the trade in American agricultural implements in this country will be to appoint reliable agents, to provide them with a sufficient stock of the patterns and implements which will be likely to find a market here, and to permit them to send out a number of machines on trial with the farmers. This, of course, is a rather expensive experiment, but will be the only way to lead to success.

DEALERS.

The leading houses in Amsterdam are: Landre & Glinderman, Spuistraat 6–8; Vissers Landbouwkantoor, Damrak 36; Figee & de Kruyff, N. Z. Voorburgwal 28–30; J. Peignat & Co., Haarlemmer Houttuinen 2; Ch. R. Kouveld, Droogbak 2; and at Groningen, Boeke & Huidekooper.

DUTIES.

At present agricultural implements imported into the Netherlands are free of duty. It is possible, however, that a duty may soon be imposed thereon, as a change in the tariff is being considered by the States-General.

ALB. VINKE, *Vice and Deputy Consul.*

AMSTERDAM, NETHERLANDS, *May 5, 1903.*

PORTUGAL.

(From United States Consul Thieriot, Lisbon, Portugal.)

HAND LABOR VS. MACHINERY.

Hand labor is high enough to justify the use of agricultural machinery.

IMPLEMENTS IN USE.

All reaping machines are imported from the United States, but cultivators, large and small, come also from Germany and England.

ROADS AND WAGONS.

American wagons are not imported, and I may safely say that this class of vehicle is but little used for transport of merchandise, except in Lisbon and Oporto. Wagons of home manufacture are occasionally to be seen in the country districts on the main roads, but, as a rule, the byways which lead to the farms are so rough that the native carts—of a most primitive make—are the only vehicles which can be used by the agriculturalists, as these will stand any amount of hard usage.

HOW TO INCREASE AMERICAN TRADE.

By appointment of good representatives and, as suggested by one of the most prominent importers of agricultural machinery, by framing a treaty with Portugal whereby reciprocal advantages might be secured to both countries.

DEALERS.

Messrs. F. Street & Co., 158 Rua do Poço dos Negros, Lisbon, and John Harker, 29 Avenida da Liberdade, Lisbon.

DUTIES.

Reaping machines and straw presses pay only 5 reis (about 0.5 cent) per kilogram (2.2 pounds); but plows and other machines pay 60 reis (nearly 6 cents). For instance, a plow that costs about $4 f. o. b. New York pays $2.61 duty here.

J. H. THIERIOT, *Consul.*

LISBON, PORTUGAL, *May 9, 1903.*

RUSSIA.

(From United States Consul-General Holloway, St. Petersburg, Russia.)

AMERICAN IMPLEMENTS.

During the year 1901, on which complete statistics are published by the Russian customs department, there were imported into Russia from the United States agricultural and farm implements to the value of over 3,000,000 rubles ($1,545,000), exclusive of the American implements shipped from German, Danish, and English ports, which proves that labor-saving machinery is extensively used in Russia. Besides the United States, Germany, Great Britain, and Austria-Hungary are shipping agricultural machinery and implements into Russia.

American implements are preferred in Russia on account of their superiority.

HOW TO INCREASE AMERICAN TRADE.

Experts who have a supply of machines in stock and exhibit them at the different country fairs held yearly in different parts of the country and demonstrate their efficiency are employed as agents, learning at the same time the needs and wants, especially, of Russian farmers, conditions of sale, etc. No other industry is being pushed with the same success in Russia as the agricultural-implement business, and the methods employed, which are much the same as in the United States, are commended to other industries.

DEALERS IN AGRICULTURAL IMPLEMENTS.

The most important houses at present selling agricultural machinery in Russia are well-known firms, which have their representatives at Odessa, Kharkof, Moscow, etc.; besides, there are a number of Russian business houses who are handling foreign agricultural machinery.

DUTIES.

Agricultural machinery, without steam motors, and farming implements pay a duty of 1.05 rubles (76.8 cents) per pood (36.112 pounds). The conventional tariff is only 75 kopecks (38.6 cents) per pood. Locomobiles and steam plows pay 75 kopecks per pood. All other agricultural implements, including reserve parts, are free.

The tariff on vehicles is as follows: Carriages (coaches, landaus, diligences, omnibuses, etc.), $91.97 each; light carriages, such as calashes, phaetons, droskies, etc., $69.53 each; vans and carts, $9.27 each; detached parts of carriages, $6.18 per pood.

W. R. HOLLOWAY,
Consul-General.

ST. PETERSBURG, RUSSIA, *July 3, 1903.*

ODESSA.

(*From United States Consul Heenan, Odessa, Russia.*)

The harvest of all cereals this year in Russia will be the largest and most satisfactory that this country has ever produced. It is not necessary to enter into any particulars or to mention any cereal beyond stating that wheat, which has the greatest interest for the United States, is yielding enormously and will be far beyond an average crop. This condition of affairs is important to our manufacturing interests because it means a large and increased demand for agricultural machines and implements next year. Labor in many places here was very scarce, and the troops were sent to work in the field. Reapers, harvesters, binders, and all cutting machines found a ready sale, and nearly all of the dealers engaged in the sale of these machines are quite out of stock.

THOS. E. HEENAN, *Consul.*

ODESSA, RUSSIA, *August 5, 1903.*

THE AMERICAN PLOW AND THE RUSSIAN FARMER.*

(*From United States Consul Heenan, Odessa, Russia.*)

In my annual report, dated November 9, 1901, which appears in full in the Commercial Relations for 1901, Vol. II, I ventured to point out that the American plow was unknown, or at least unsold, in Russia. I see no reason why this should be so. The superiority of the American steel soft-center plow is universally admitted. As a rule, it polishes like a mirror and scours in all kinds of soil. The shape of the moldboards is such that it turns the furrow completely over with the least friction, while the German plow, so popular in this country, drops the furrow before it is turned entirely over and prevents the plow from running smoothly. The same is true, only to a greater extent, of the Russian plow. I have received letters from manufacturers at home which confirm my statement in regard to the lack of success the American plow has had in this country. One firm wrote that during 1901 it had sent two men to travel in Russia, but the result was an absolute failure. The men reported that they were unable to sell any plows, nor did they see any plows of American manufacture during their stay in the country. It will be understood that this statement does not include cultivators for garden use, etc., as the American cultivator has been sold in Russia for fully twenty-five years, and is both well and favorably known.

With the conceded superiority of the American plow, the question naturally arises, Why has it made no progress here? The usual definition of a plowman given in the dictionaries is "one who plows, or who holds and guides a plow." This definition would not hold good in Russia, because the man neither holds nor guides the plow; the plow guides itself. I would direct the attention of manufacturers to the illustrations, which appear farther on, representing the German plow which practically holds this market. The Russian plow is of the same pattern and sells for about the same price. It will be noted that these plows have a carriage in front which supports the beam, and when once the plow is started it is not necessary to either hold or guide it. I have given the dimensions, weight, and cost of each of these plows, and it will be readily seen that the best American plow could not compete successfully with the prices. The duty is by weight and amounts to 75 kopecks (38.6 cents) per pood of 36.1 pounds. The plows illustrated are not the only kinds in use in this country, but it is with these plows that our manufacturers will have to contend if they wish to secure a share of the trade here. Both the German and Russian plows are inferior to the American, but it should be remembered that we want trade. While patient effort would certainly bring success to our plow among the wealthier class of the farming population, this success will hardly be widespread. Every country has its own customs, and the Russian farmer will not use a plow which does not guide itself. It is for our manufacturers to decide whether it is worth while to attempt to overcome this prejudice, or to let the market remain with the Germans. It ought not to be beyond American skill to put a heel on the American plow, to apply a pair of wheels on an axle and attach the same to the beam, thus to all intents and purposes giving this market what it desires.

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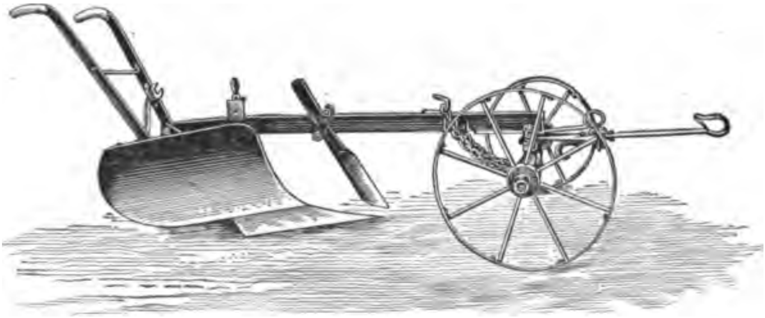
* Republished from CONSULAR REPORTS No. 266 (November, 1902).

The Russian farmer likes two, three, four, and even five share plows, because they do more work, requiring additional horsepower but not additional men. Sulky plows could be sold here, and in fact have been sold, but their high price will prevent their general introduction. Plows can be purchased here at prices ranging from $3 up to $40. I have not at hand the latest statistics relating to the importation of plows, but in 1899 Germany sent to Russia about $650,000 worth, Austria $30,000, England $7,000, the United States $4,000, and France $1,000. These figures are a tribute to German energy, as well as a rebuke to other manufacturing nations. I am convinced that our manufacturers can capture the major part of the plow trade of this country, but it will take both time and money to do it. I notice a press statement that a 10-carload lot of American plows is en route for the Russian market, and this may be taken as a hopeful sign. A man behind the plow is not required in this country, but a man with the plow is an absolute necessity for its sale. The man who sells a plow in Russia must be able to work it and must believe in it. Such a man passed through Odessa during the present year, and as he had taken the precaution to ship a few plows ahead and found them here on his arrival he was in a position to demonstrate what they could do. The man was an enthusiast and his success was immediate. The plows sold, it is true, were sulky plows. In conversation with him, it was mentioned that the high price would probably prevent sales. The agent insisted that, given an opportunity to show what his plow could do, he could sell them at his own price. He was quite right; he sold the few he had with him and ordered many more, though he admitted that the number which he could dispose of would be limited. This report, however, is not written in reference to sulky plows, and is in no manner affected by what has been said about them. The cuts which follow may not impress our manufacturers favorably, and doubtless will be regarded as in every way inferior to their own models. It is important, however, that they should be studied for what they may be worth.



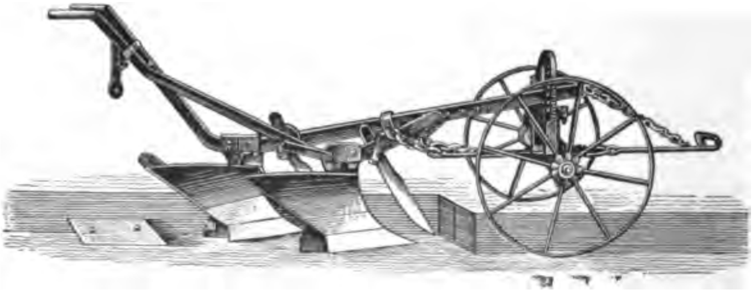
The above cut represents a self-guiding steel plow of the system "Sack," with steel beam, skim colter, and carriage with a body of cast iron or cast steel, as may be ordered. The prices are:

No.	Depth of furrow.	Horses.	Weight, with extra share.		Price, with extra share.	
			With skim colter.	Without skim colter.	Cast-iron body.	Cast-steel body.
	Inches.	*Number.*	*Pounds.*	*Pounds.*		
1	18	6 to 8	414	....	....	....
2	14	6	342	....	....	$25.00
3	10	4	....	216	$15.00	16.00
4	8	4	....	207	14.50	15.25
5	7	3	....	189	13.00	14.00
6	6	2	....	171	12.50	13.25

Separate skim colters for Nos. 1 and 2, at $1.88.

Separate skim colters for Nos. 3, 4, 5, and 6, at $1.15.

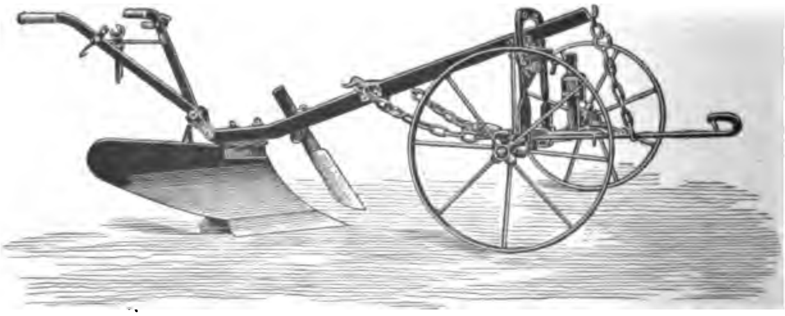
Plows Nos. 2, 3, 4, 5, and 6 are also prepared with higher bodies of cast steel. Unless otherwise ordered, these plows are usually made with hardened armor breast, a profile steel beam, handles screwed on, and a body like the letter S. When specially ordered, they are furnished with M. K. or R. shaped bodies. All the above plows are sold with or without a skim colter, and also with a movable wing.



This cut represents a double or two-share plow of the system "Sack," with carriage. The frame of these plows is very strong and is of iron, the body of steel or cast iron, and the shares and soles of forged steel. The breast consists of two parts, the upper part of sheet steel and the lower of wedge-shape rolled steel. The shares, breasts, and soles are fixed to the bodies with nut bolts. When ordered, the entire breasts are made of hardened armor steel. These plows are adapted for a light or medium soil. The prices are:

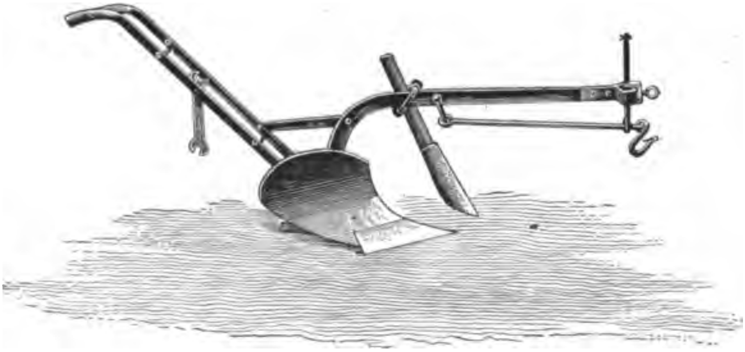
No.	Depth of furrow.	Width of furrow.	Weight.	Price, with steel bodies.
	Inches.	*Inches.*	*Pounds.*	
1	7	19	252	$21
2	7	19	270	21

This plow is also made with a steel frame when desired.



The above represents the "Colonist" steel plow, with colter and carriage, and a double T-shaped (I) beam. The carriage may be a transferable one or not. The beams of these plows, which are of exceptional strength, are of I-shaped steel, which, to prevent clogging, is twisted aside. The plows make a broad and clean furrow. The body is of forged iron and is fitted with a simple appliance for the regulation of the depth of the furrow. For the guidance of the plow, there is attached a firmly built carriage with a transferable rest for the colter. These plows are made in the following sizes:

Width of furrow.	Depth of furrow.	Horses.	Weight.	Price, with extra share.
Inches.	*Inches.*	*Number.*	*Pounds.*	
$10\frac{1}{2}$	7	2	153	$13
$12\frac{1}{2}$	$7\frac{7}{16}$	2 to 3	171	15
14	$8\frac{6}{16}$	4	207	16
$15\frac{3}{4}$	$10\frac{1}{16}$	4 to 6	234	17

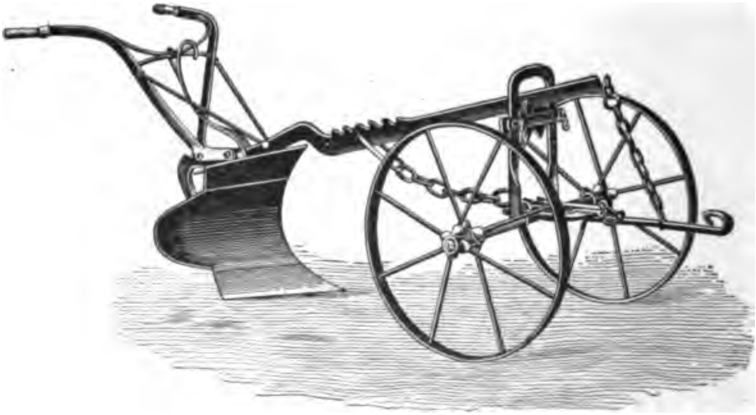


The above cut represents a garden plow without a carriage, with an iron frame, steel share, and steel breast, and made extremely strong. This plow is said to run easily and to be very true. The share is long and pointed, in order to prevent the couch grass and roots from adhering. The breast stands steep and is much bent, in order that the soil may be well thrown and broken. Prices are:

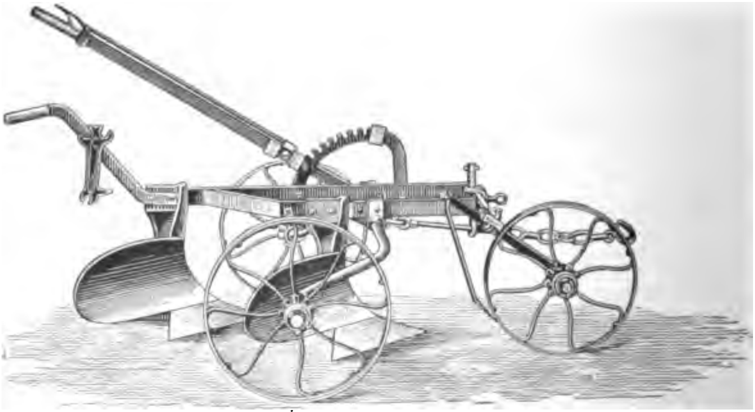
Depth of furrow.	Width of furrow.	Weight.	Price, with extra share.	
			Without a wheel.	With a wheel.
Inches.	*Inches.*	*Pounds.*		
7	$9\frac{3}{16}$	90	$8.00	....
7	$9\frac{3}{16}$	108	....	$10.00
$6\frac{1}{8}$	$8\frac{3}{4}$	72	8.00	....
$6\frac{1}{8}$	$8\frac{3}{4}$	90	....	9.40

Garden plows with two wheels are also much in use. Prices are:

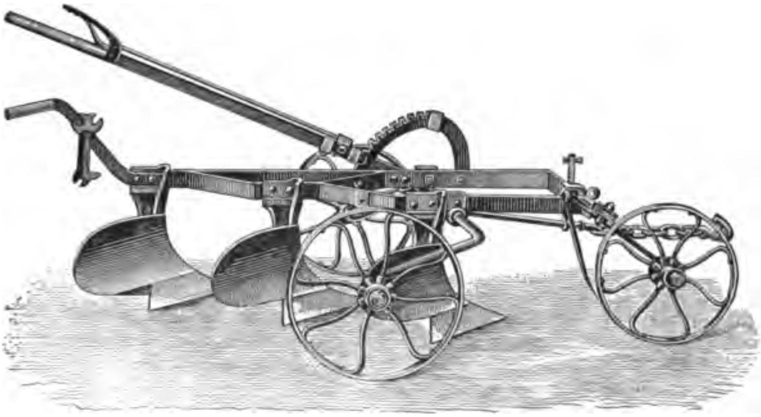
Depth of furrow.	Width of furrow.	Weight.	Price, with extra share.
Inches.	*Inches.*	*Pounds.*	
7	9 3/16	126	$12.00
6⅛	8¾	108	11.25



This represents a twin or turning plow, having an iron frame, steel share, and steel breast, and intended for gardens and hilly localities. It is with or without carriage, and is suitable for light or medium soil. The width of the furrow is 8¼ inches; the depth, 7⅞ inches. The weight without carriage is 108 pounds; with carriage, 180 pounds; and the price is, with extra share, $14.50

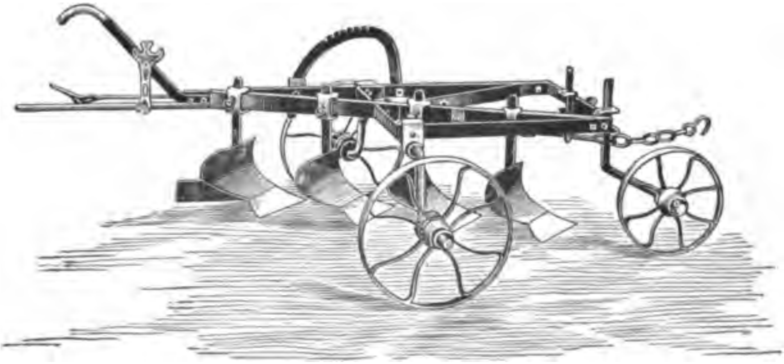


This cut represents a two-share steel plow, with the ordinary means for regulating and raising, with long breasts for medium soil. The width of furrow is 18 13/16 inches; depth, down to 7 inches; weight, 288 pounds; and price, $26.



This shows a three-share steel plow, with ordinary appliances for regulating and for raising. It is for use in medium and in viscid soil and is made in the following sizes:

No.	Width of furrow.	Depth of furrow down to—	Weight.	Price, with extra share.
	Inches.	*Inches.*	*Pounds.*	
1	28⅝	7	261	$25.00
2	23⅝	7	360	30.00
3	28 7/16	7	360	32.50



This cut represents a four-share plow, with the ordinary appliances for regulating and for raising. It makes a furrow up to 4 13/16 inches, and is used for stubble, for covering seed, for the level cutting of clover and grass turf. The distance between the separate shares is so great that clogging seldom occurs. The steel shares and breast are fixed to the quadrangular steel frames by means of nut screws. These frames are firmly attached to the beam of the iron stand by means of strong clasps, and are easily shifted. These plows are made in three sizes:

No.	Width of furrow.	Horses.	Weight.	Price, with reserve share.
	Inches.	*Number.*	*Pounds.*	
1	23⅝	4	333	....
2	23	4	315	$30
3	26 13/32	4	320	30

The four-share plows are built so that they can also be used as three-share plows.

THOS. E. HEENAN, *Consul.*

ODESSA, RUSSIA, *July 14, 1902.*

AGRICULTURAL MACHINES IN RUSSIA.

The German consul in Odessa, according to Das Handels Museum of August 6, in reporting to his Government, says:

A sharp competitive contest in the sale of agricultural machinery has just broken out in Russia. Great Britain has succeeded, by means of cheap sea freights, in securing the lead in the sales of steam thrashers with locomotive attachments. Germany finds it hard to compete with the cheaper prices offered by the British merchants and manufacturers. America was once supreme in this field. Russia is making every effort to emancipate herself from foreign agricultural machines, particularly from gins and cutting, sawing, drilling, boring, hulling, and scutching machines. In gins and scutching machines Russia has progressed so far and so fast as to exclude German competition. Scutching machines are very light and pay an uncommonly high freight rate as a practically prohibited product; therefore it is not hard for Russia to build these more cheaply than she can buy them abroad or after they have been brought in. German gins get a preference over Russian because of the better cast iron used in the former. When, however, as almost always happens, the gins go in in single numbers, they are regarded as industrial rather than as agricultural machines and pay a much higher rate of duty. Nor does the fact that they serve agricultural purposes almost entirely make any difference. The number of gins imported is, therefore, much smaller than it otherwise would be. The mowing machines imported into Russia are mostly American. With these, neither Germany nor England can successfully compete.

America and Germany send rakes. The German rakes, however, are bound to vanish entirely from the Russian market, since the teeth in comparison with the American leave much to be desired. Plows that formerly were imported mostly from Great Britain come very rarely from that country now, and were in 1901 mostly German. Although several German concerns have achieved distinction in this branch, it is cause for regret that many low-grade goods get into the Russian market to the no small injury of the reputation of the German product, thereby diminishing the demand. Russia produces a good one-share plow of her own, southern Russia turning out 200,000 every twelve months. This seems all the more remarkable when it is remembered that the duties are exceedingly low and German manufacturers are always able to put good plows on the Russian market at prices below those asked for the best Russian product. The great mistake made by the German plow makers is in not having Russia completely covered by competent traveling salesmen. They put their samples and interests into the hands of agents who lack business ability and energy, so that the traveling salesmen of the active and energetic South Russian, who, although he works with little capital, often succeeds in obtaining big orders because the Germans are not in a position to fill them on time. The American plow has secured no remarkable advantage during the time under discussion. Germany sends large numbers of mowing-machine knives. One often hears complaints about the poor quality of the goods delivered. The cause of the difference is due to the fact that many traveling salesmen of the Iserlohn (German) commission houses divide up their orders among a great many small manufacturers, thus getting anything but a uniform grade or class of goods. Many knives or machine blades are being bought in America, and it is to be feared that the German articles will be driven out if the present so-called Iserlohn system is not changed.

The call for German steam thrashing machines is nothing like what was looked for from Russia's increased demand. Russian competition, pupil of the German industry, is making progress in this line. The same thing is true in regard to chaff-cutting machines. For the first time Danish manufacturers appeared to advantage in the market. Russia offers Germany a market for milk separators that has never been worthily considered. The drums of the separators go in free of duty. Up to the present time Sweden and Denmark have supplied these. A factory in northern Russia imported the drums from Scandinavia, made the other parts itself, and put them all together.

The demand for oil presses is growing greater. The favorite old-fashioned method of pressing the oil out by means of oak beams is giving way to modern methods and machines. South Russian factories have the advantage offered by being able to produce a simple, sensible oil press—one that finds favor and sells well.

The Ural country, cis-Caucasia, Siberia, and Manchuria offer markets for all kinds of machines and apparatus. Machines for mills, bake shops, sugar refineries, distilleries, tanneries, etc., are needed. An agent with a knowledge of the lands and their languages would win in the effort to get markets. Such agents have helped Germany and the United States.

Eastern Siberia offers an enormous field for iron and steel ware for building purposes; also for tools, etc., for carpenters and locksmiths. These lines are largely in the hands of Germans. There is also a large demand for guns and hunting material. The United States, by establishing a base of supply, leads all others in this line. The buyer in these far-off parts never bothers much about catalogues, particularly when he can get his hands or eyes on the object to be purchased. He prefers to pick from a large assortment and is willing to pay the price demanded, even though it is high.

SPAIN.

(From United States Consul-General Lay, Barcelona, Spain.)

HAND LABOR VS. MACHINERY.

The sale of American agricultural machinery in this country is a matter that has received my careful attention ever since I came here, and it is satisfactory to know that, relatively, considerable progress has been made within recent years, in spite of the great difficulties that have had to be contended with.

While the cost of hand labor is very cheap in all parts of Spain and does not seem to justify the farmer owning very small farms using even the modern plow, on the larger farms agriculturalists not only can but do use labor-saving machinery of the most recent types.

With reference to the northeast portion of Spain, comprising the district under my jurisdiction, I may say that the sale of labor-saving agricultural machinery is all but impossible. Labor is cheap and on this account there is not much inducement to lay out money on what is looked upon as costly machinery. The daily wage of a laborer in the fields varies from 1.50 to 5 pesetas (21 to 70 cents), according to the locality and the season of the year. The landed proprietors also take little interest in their estates, which are parceled out and sublet to small farmers in return for payment in kind. These farmers are, as a rule, entirely dependent on the result of the crops for their livelihood and have no capital to spend on improvements. The country, too, is mountainous, and there is no wide extent of arable land

While in the northwestern and southeastern districts and the country on the northern coast the outlook for selling modern agricultural machinery is not bright, in the center and in the southwest of Spain the farms are large and offer a virgin field for our agricultural machinery, as will be shown in the reports from our consuls at Madrid, Bilbao, and Seville.

IMPLEMENTS IN USE.

Until 1900 modern agricultural machinery was practically unknown in this country, and reports from all parts of the agricultural districts show the larger farmers and experimental farms are all commencing to use modern machinery.

The machines most used in Spain are harvesters. Some plows have been imported and sold to beet-sugar planters, but it was found that the models were promptly imitated and offered at a lower price by native makers. These plows are much inferior to those of American make, but being cheaper they are preferred, which will not be wondered at when I state that in many districts of Spain the plows in use are of the same pattern as those used by the Romans. The Deering, Allen, and McCormick companies have already secured a footing here, and others are following their example.

AMERICAN MACHINES AND IMPLEMENTS.

American machines are certainly popular where they are tried and their merits properly appreciated, but in order to get them tried the importers have had to overcome innumerable difficulties, besides an ingrained prejudice against novel methods that firms in our country have no idea of.

The machine that we seem to have had difficulty establishing is the thrasher. Almost all the thrashers used in Spain to-day are those of English make, the farmers preferring them because they break or crush the straw, which is used for food for cattle and horses.

AGRICULTURAL COLONIES.

In 1868 a law was promulgated with a view to inducing capitalists to found agricultural colonies in different parts of the country for developing its natural resources. This law allows all implements used by these colonies in cultivating the soil, harvesting the crops, and preparing the fruit to be imported at the nominal duty of 1 peseta (19.3 cents) per 100 kilograms (220.4 pounds). In spite of the inducement thus offered, the scheme for establishing these farming colonies has not met with the response that was expected, and Spain, in this respect as in others, continues disregarding her natural advantages. Agriculture is too often left to the poor to eke out a precarious existence, unsupported by those who ought to be the first to devote their capital to the improvement of the soil. Irrigation, too, is neglected, and practically the only irrigation works are those constructed by the Moors during their occupation of the country, which have brought such prosperity to the districts of Valencia and Granada.

HOW TO INCREASE AMERICAN TRADE.

The most effective method of introducing agricultural implements or vehicles into Spain is for our manufacturers to bear some of the initial cost of exploitation. With the exception of reapers and a few other American labor-saving devices that are known to be superior to other foreign makes and have no competition, farmers must see the machine work and will not be convinced by testimonials and illustrations in catalogues. The agents of agricultural machinery, on the other hand, are usually not enterprising enough to purchase a few sample machines to show farmers their merits and value as labor-saving devices. It is therefore necessary in this country—and the Americans who now enjoy a respectable trade in Spain have adopted the method—to send a representative to Spain with samples to work under the direction of an agent here, and when once a business is fairly established to withdraw the representative and depend upon the agent thereafter. This plan has been modified somewhat, and sometimes with success, by the employment of local persons to travel and explain the working of machines to farmers and subagents, but I would advise our manufacturers to choose as their representatives Americans who speak Spanish and, above all, to send samples, to be paid for when sold. When a business is once established, our firms can demand cash in New York against documents, but these terms are scorned here when an article is unknown, or the agent must take all the risk of selling it. Even then a prospective exclusive agency offers him no inducement to diverge from his rule to demand credit.,

Two years ago a Spanish company constructed a cement mill, situated south of the Spanish Pyrenees, near the town of Pobla de Lillet, and in order to carry the American machinery to equip this mill from the nearest railway station to the works purchased a Best locomobile from California, a cut of which is inclosed herewith.* To be sure, this American labor-saving device and "time killer" would probably never have reached Spain if American engineers had not been chosen to construct this mill, but this case serves as an argument in support of my advice as the best means of introducing American machinery. A timber-limit owner near Pobla having seen this locomobile in operation, realizes its advantages over mule power and is now negotiating for the purchase, I understand, of several American locomobiles.

I inclose a photograph showing this locomobile hauling two cars, of 16 tons capacity, over the mountains; also photographs taken by our consul at Malaga, showing the old-fashioned styles of agricultural implements used there, as follows:†

Fig. 1 represents the Andalusian plow.

Fig. 2 represents a typical plowing scene.

Fig. 3, thrashing grain.

Fig. 4 shows the knifeboard construction of the "trilla" (referred to in my report as the trill).

Fig. 5 shows three hand implements: (1) "Rastrillo," similar in purpose to the American rake; (2) "Lejon," used in rearranging the earth surrounding irrigation canals; and (3) "Azada" (minus the wooden handle similar to others), is used in breaking the larger clods after plowing.

Fig. 6, sail-rigged windmill.

Fig. 7, plowing in the Province of Barcelona.

I also send under separate cover catalogues of the most popular modern implements, with prices, now sold in Spain, for inspection by the association. ‡

Our manufacturers of agricultural machinery can not get a better idea of the conditions for increasing their trade in this country than from the following letters from farmers and agents of agricultural machinery, and especially from the one from Mr. Evaristo Monne, a practical American farmer, of whom I have asked an opinion on the prospects of extending the sale of our machines in his district of Valladolid.

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* See page 56.

† The illustrations here referred to will be found at the end of the consul-general's report.

‡ On file in the Bureau of Statistics.

Mr. Evaristo Monne, of Valladolid, to Consul-General Lay.

In answer to your kind letter of the 29th of April last, asking me for information on agricultural machinery in Spain, I have the pleasure of relating my own experience in the agricultural business.

At the beginning of 1900 I hired a very large farm that for the last five hundred years was used only as pasture lands. My farm is called Ventosilla and has an area of 6,990 acres; of these there are 2,500 acres to be cultivated. More than half of this I can irrigate, and the remaining 4,490 acres are of evergreen oaks, used for pasture and charcoal making. I have already 1,850 acres cultivated and sown with wheat, barley, and oats, and also 150 acres planted with potatoes.

I am using all modern machinery from different parts of the world, as without them I could not conduct such a large business. For breaking the ground I have been using German and French plows. The German plows are like the American, the French ones being called Brabants; they are very good but rather too heavy. Besides the plows, I have French harrows, croskill rollers and flat ones, sugar-beet sowers and diggers, and potato planters and diggers. From the United States I have three 5-foot binders (McCormick) and seven 6-foot Deering binders, some Planet Junior cultivators and some from the Standard Company, some weeders and harrows from the Standard Company, five wheat sowers from the Empire Company, potato sorter and digger from the Aspinwall Manufacturing Company, a thrashing, straw-cutting, and bruising machine and a 12-nominal-horsepower locomobile from Ruston, Proctor & Co., and a potato digger from England, besides many other machines which I purchased through advertisements, but which have given bad results. Until now, I have been spending piles of money, as the land was not in a very fit condition to produce, but from this year on I think I will be getting money in, as I have beautiful fields of wheat and all the implements ready for harvesting when the time arrives. It would be utterly impossible to work this farm without the modern implements, because the wages of the laborers, even if they are low, would take all the profits.

In answer to your questions, my opinion is this:

1. The cost of hand labor is sufficiently great to justify the use of labor-saving machinery by the agricultural and manufacturing interests.

2. There are some modern agricultural implements used in preparing the soil and sowing and planting the seed, but this has come by degrees since about five years ago. The implements having the largest sale and use are American, English, German, and French plows, American and German machines for sowing cereals (mostly American), and American harvesting machines. The largest farms use modern implements, but the small ones continue working with the wooden plow.

3. There are some American agricultural implements, and they give satisfaction and good results and trade could be increased if the implements were cheaper. I do not mean by the manufacturers, but by the sellers here; between the exchange, the duties, freight, and the large profits of the seller, the implements cost so much that there are few who can pay the prices, and the small farmer is out of the question, as he could never find the money to buy them. For instance, last year I bought here an American implement for which I paid $24 in Spanish money, and at the same time I ordered a similar one from New York and after paying the exchange, duties, and freight, I figured the total cost at $12 placed on the farm; so you see the difference is too great. There are no American vehicles or wagons sold here that I know of, two-wheeled carts being in general use on the farms, although I doubt not that the wagons could be used to advantage.

4. The most effective means of introducing or increasing the sale, in my opinion, would be to sell cheaper and allow the farmer to try the implement before

purchasing it, so that he can be sure that what he buys is right. For instance, last year I bought a potato digger from England and one from the United States, but both turned out useless and I am $300 out of pocket. I really need some potato diggers and planters that would do fine, clean work, but I am afraid to buy them without first seeing how they work. I had a number of farmers coming to see the diggers, so that they could buy some if they liked them, but they all pronounced them useless.

I am sure that working it in the right way all kinds of machinery from the States could easily be introduced into Spain.

Yours, very truly, EVARISTO MONNE.

Manuel Garcia Perez, of Jeres de la Frontera, to Consul-General Lay.

[Translation.]

I beg to acknowledge receipt of your letter of the 18th instant, and take great pleasure in submitting herewith such information as I can touching the matter.

1. The following is a list of the agricultural machinery most in use in this section: Ransomes, Sims & Feffries; Clayton & Shuttleworth (Limited); Hornsby & Sons; Ben-Reid & Co., all of England; and Walter A. Wood and the Deering Harvester Company, of the United States.

2. The selling prices of the different brands of machinery are quite uniform and vary from year to year on account of the instability of exchange on foreign countries.

3. Thrashing machines, portable engines, and plows we have imported largely from England, as the English brands are considered stronger and have more resisting powers than the American ones, besides being better adapted to the soil of this country. On the contrary, the American reapers, binders, and cutters are giving greater satisfaction than those of English make.

I am sending you under separate cover some catalogues.

I have no objection whatsoever in your mentioning my name in connection with your report.

Should you desire any further information, I should be most pleased in sending it to you.

Yours, very truly, MANUEL GARCIA PEREZ.

Esteban Perez Jerrados, of Valladolid, to Consul-General Lay.

[Translation.]

There are many brands of cultivating plows used for the purpose of light furrows and drawn by two mules and not a few made for deep furrows, to be drawn by four mules.

Steam plows for deep plowing have never been seen in this country. There has been much talk that such and such an agricultural commission or association would introduce them, but it has not yet been done. Heavy agricultural machinery naturally requires extensive and level grounds for its employment, and in this country the division of property and the fact that such machinery has not been practically illustrated to be effective will prevent its introduction for a long time to come.

But coming down more to the facts in regard to plows and farming implements for wine-growing countries, I should say that the "Vernette" plow comes nearer meeting the needs of a small farmer in this section. This plow is sold by Señor Andres Rodrigo, of Saragossa. He also sells the following plows: The "Bisurco-Roturaciones," a plow with three tongues for breaking ground; the "Benadores," a three-blade plow; etc.

The cost of labor, ranging from 1 to 2 pesetas a day, according to the season of the year, is very dear when one takes into consideration that one laborer, with a "Vernette" plow, can do as much work in one day as six ordinary laborers. Small machines are necessary so as to avoid injuring the small vines running out into the furrow.

Every day sees an increase in the use of English scoop plows, which at once crush the clods and prepare the land for sowing. These plows come from England and can be repaired in this country, inasmuch as the seller always has a stock of the different composite pieces of the plow. Sowing machines are currently used, but reapers will not ge generally used on account of the smallness of the farms. There are not more than half a dozen thrashing machines in the whole Province.

The American and English machines are those that are sold most in this section.

Yours, truly,

ESTEBAN PEREZ JERRADOS.

Angel Ruiz de Huidobro, of Valladolid, to Consul-General Lay.

[Translation.]

In Spain, although the last few years have seen the introduction of certain modern agricultural machinery, the process of tilling the soil is still carried on in the most primitive manner.

The manufacturers, or more properly speaking the sellers of this class of machinery in Spain, have as yet never made a study of the backwardness of the farming class in employing this method of cultivation, and in my opinion this is one of the most important causes of the failure to introduce the modern systems.

Once the farmer has personally studied all the improvements, once he has traveled and seen the processes employed in other countries and appreciates their advantages, it always results that he becomes an eager customer for this class of machinery. If this should occur, the manufacturers of agricultural machinery would not have to resort to further means of selling their products than the establishment in Spain of branch houses equipped with a well-assorted stock and putting the price at reasonable figures; but as the case is exactly the contrary, I am of the opinion that firms seeking a market here with any hopes of success should begin by studying the country and its inhabitants, the manner in which farming properties are divided up, the character of the farmers, the state of cultivation of the lands, etc., and with this data before them proceed in a manner entirely distinct from that employed up to the present; that is to say, they should place themselves in immediate contact with the farmers themselves and see to it that they have an opportunity of seeing the machines work, granting them facilities to acquire such as they may need, and even, if necessary, sell the machines to be paid for on time—in a word, changing entirely the mode of procedure now current in Spain. Up to the present there are only depositories of modern machinery in four or five principal cities of Spain, and the only propaganda made is limited to a few advertisements which appear from time to time in the papers, and the personnel charged with their sale is not always the most competent and serious that the case requires. The explanations usually given of the merits of such machinery is that such and such machinery is the best or that such and such a house sells the most modern and improved articles. What is the result of this? Machinery is sold at prices ridiculously high, and this because few machines are sold, and these few must bear the burden of the lack of greater sales. My opinion is that the ultimate result will be that more machines will be sold and less money charged for each one.

When the advantages of a machine are beyond doubt, it is not difficult to convince the farmers of the benefits of using them; but up to a certain point the farmers are justly distrustful, for many times they have been deceived. Right here in

Valladolid, for example, I once saw advertised a thrasher claimed to be of a most superior quality. Afterwards I had occasion to see the machine working and was convinced that it was not only useless, but even prejudicial; for, besides working very badly, it wasted a large amount of the grain. It is not strange, therefore, that the farmer should wish to see the working of the machines before buying them. On the contrary, I can give you just the opposite case. I am using a certain class of plows that are giving me the greatest possible satisfaction. They are of the most superior construction, work splendidly, and the only objection to them is the high price. When I took them to my estate, the neighboring farmers looked upon them as useless innovations, and even scorned them; but having seen them work, without my having made the least propaganda in their favor, many of them came to me and asked me to buy them a number of said plows, notwithstanding the high prices. This I did, and a great number of these plows are now being used in this district. The same thing occurs with sowers, reapers, etc.

But one must not be content with selling his machinery only to large farmers (which up to the present has been done); it is also necessary to reach the small farmers, for there are many places in which this class of consumers abound owing to the smallness of the farms. In such a case, the great difficulty to be overcome is the relation of the prices of machinery of high price to their comparative small resources. In this case a different policy must be pursued. For example, one of the machines destined to universal use in Spain is the thrasher, but there are relatively few farmers of sufficient importance to buy such machines and save thereby. In such cases there ought to be a number of such machines in every Province to thrash the wheat and charge therefor a certain per cent of the amount thrashed. In fact, I am not sure but that in a short time the machines would earn their own intrinsic value.

The firm which aspires to great success in Spain must not limit itself to sending or appointing a commission agent here who brings over a dozen pieces of machinery and contents himself with selling a small amount at enormous prices. In such a case the farmers will continue to till the soil with their primitive means and will quietly leave the agent to cry his wares without result. What is needed is an energetic and interested person, who should devote his energy to the practical illustration of the merits of modern machinery. I should advise his selecting some large farm (a thing easily to be done here in Valladolid), where such machinery could be tested and where the farmers in this Province can see with their own eyes the merits and advantages of farming machinery. If it were possible, it would not be a bad plan to arrange some method of selling certain machinery on trial.

In regard to your question as to whether the wages of day laborers will permit the introduction of farming machinery, I have to say that, although the wage in Spain is not, as a rule, very dear, nevertheless I think that in many cases the employment of such machinery is not only advantageous but necessary. There are many classes of work done by hand now that must in the future give way to machinery, even though the farms be small and the wages paid to the laborers very little.

Such is the case with reaping and many others. The reaping by hand is becoming more difficult every day on account of the increasing exigencies of the workmen; and the question of strikes, such as have recently occurred in southern Spain, has greatly influenced public opinion in favor of modern machinery which does not depend upon such occurrences.

I can justly say that the American farming machinery is by far the most satisfactory and is favored in this Province, for in addition to their superior make they are usually cheaper than any others.

As a rule, however, it is considered (I am not speaking personally, for I have never seen them) that English thrashers are superior to those of America.

Personally speaking, the majority of agricultural machinery which I employ on my estate is of French make. The only American machine which I use is a "Deering" reaper.

Very truly yours, ANGEL RUIZ DE HUIDOBRO.

DEALERS.

The following are the most important farmers and dealers in agricultural machinery in this district (Barcelona) and at Valladolid:

Farmers.

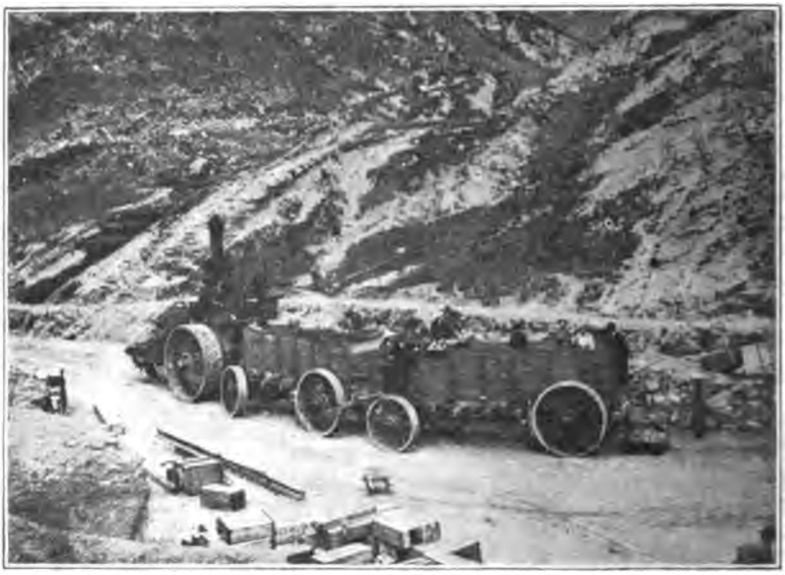
Julio Pimental, Retuerta, Valladolid.
Luis Francos, Villaviciencio de los Caballeros, Valladolid.
Eleuterio Melero, Villaviciencio de los Caballeros, Valladolid.
Millan Alonso Lastreras, Valladolid.
Ecequiel Martin Calero, Calle de Colmenar, Valladolid.
Angel Ruiz de Huidobro, Valladolid.
Caamano Hermanos, 12, Calle Acera Recoletas, Valladolid.
Pedro Martin, 6, Calle Pi y Margall, Valladolid.
Esteban Perez Jerrados, Campillo de San Nicolas, Valladolid.
Emilio Manso, Duque de la Victoria, Valladolid.
Colonia Agricola "La Poveda," Madrid.
Colonia Agricola e Industrial del Duero, Madrid.

Dealers in agricultural machinery.

A. Eyries, Calle Veinte de Febrero, Valladolid.
Garteiz Hermanos Yermo & Co., Bilbao and Valladolid.
Sturgess & Foley, Valladolid and Madrid.
Herrera y Soriano, Bilbao.
Alberto Ahles & Co., Paseo de la Aduana, 15, Barcelona.
Ignacio Sanpere & Co., Ronda San Pedro, 50, Barcelona.
Vda. e hijos de G. Quintana, San Pablo, 46, Barcelona.

JULIUS G. LAY, *Consul-General.*

BARCELONA, SPAIN, *August 7, 1903.*



American locomobile used in Spain for hauling 2 cars of 16 tons capacity.

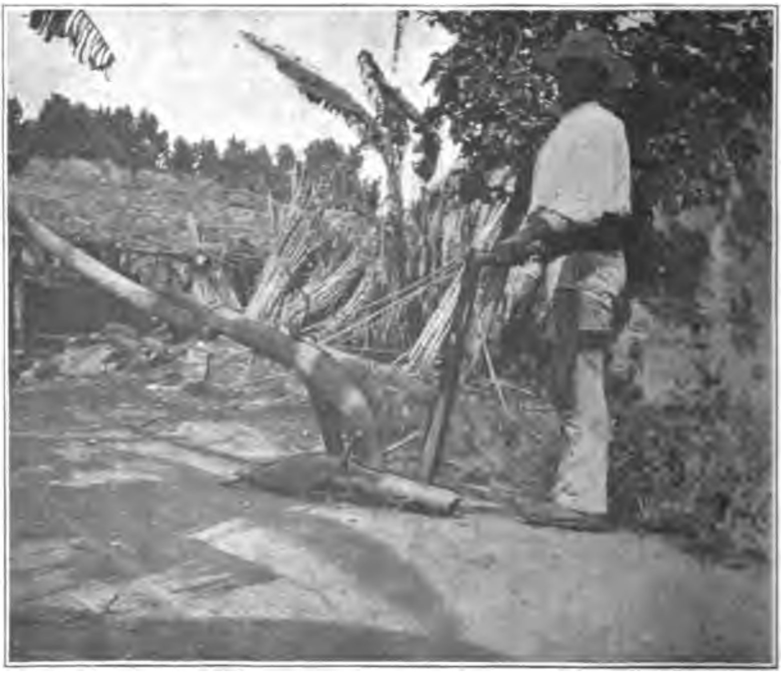


Fig. 1.—Andalusian plow.

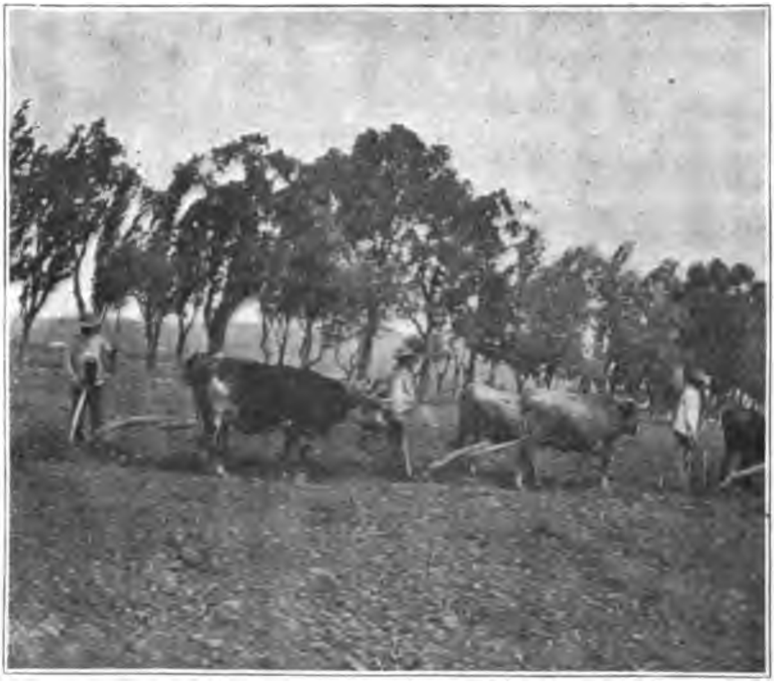


Fig. 2.—Typical plowing scene in Spain.

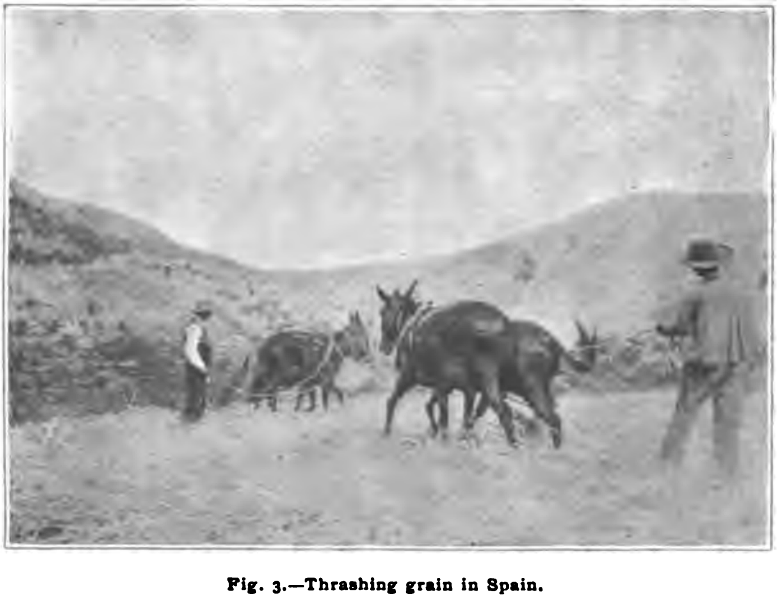


Fig. 3.—Thrashing grain in Spain.

The man is standing on a board about 4 to 6 feet long. Under this board are placed longitudinal knives the length of the board, which, as it is drawn around the circle, "thrashes" the grain.

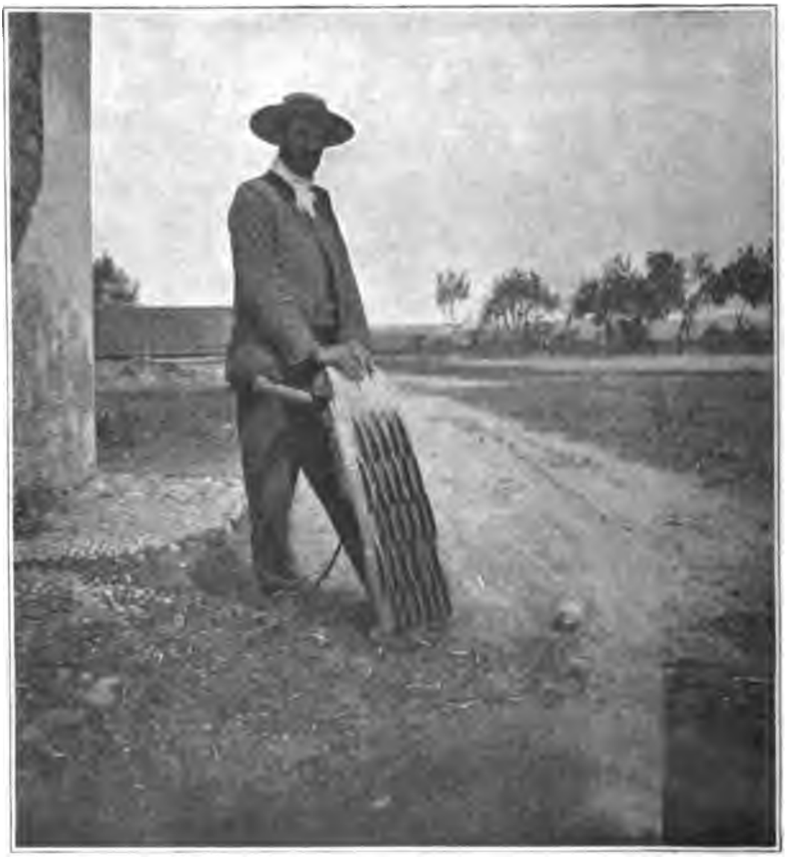


Fig. 4.—Knifeboard construction of the Spanish trilla, used in thrashing grain.

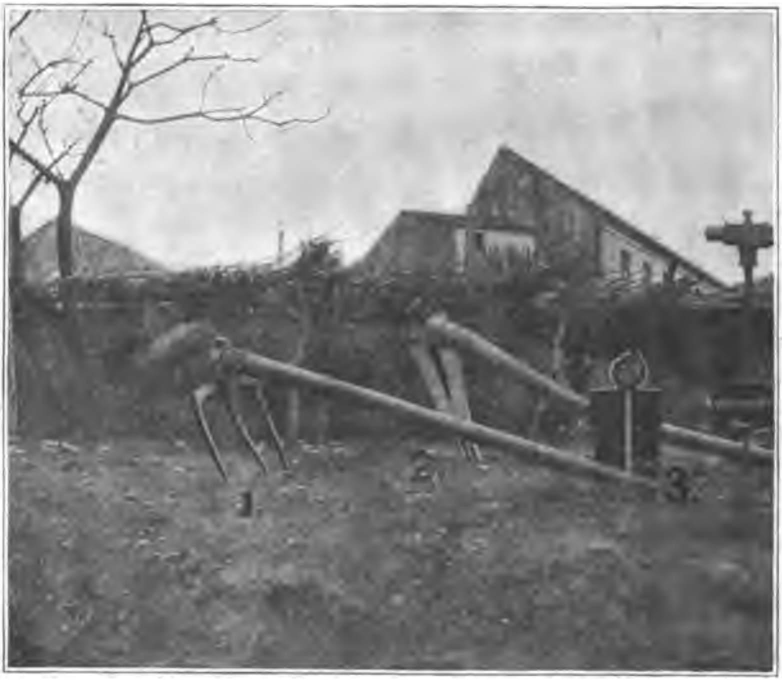


Fig. 5.—Hand implements: (1) The rastrillo (rake); (2) the lejon, used in rearranging the earth surrounding irrigation canals; (3) azada, minus the wooden handle, used for breaking the larger clods after plowing.

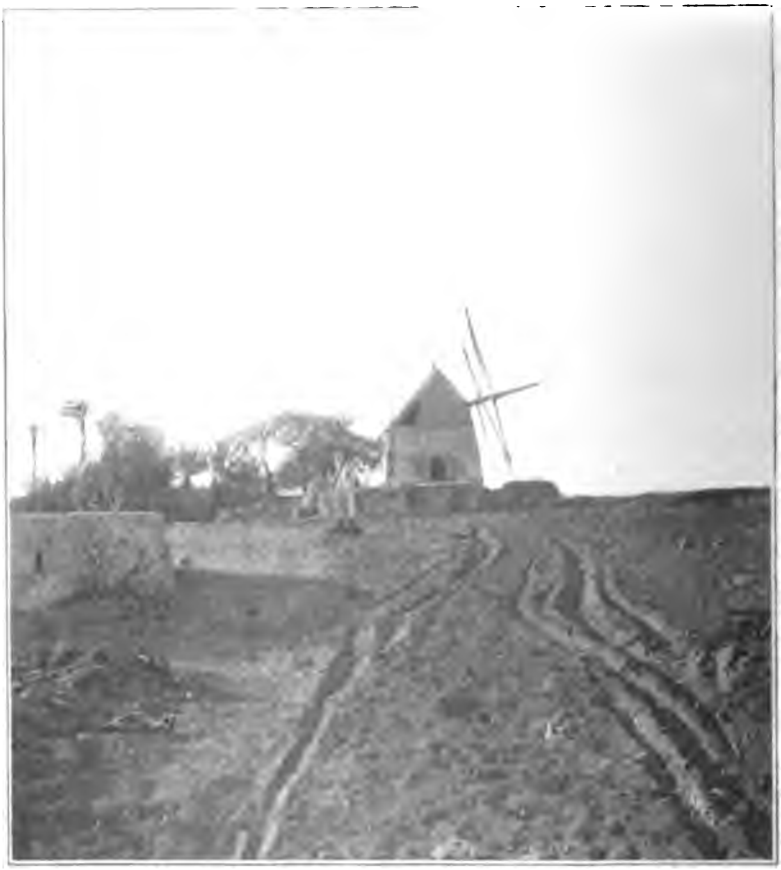


Fig. 6.—Sail-rigged Spanish windmill, which the farmers say does excellent work.

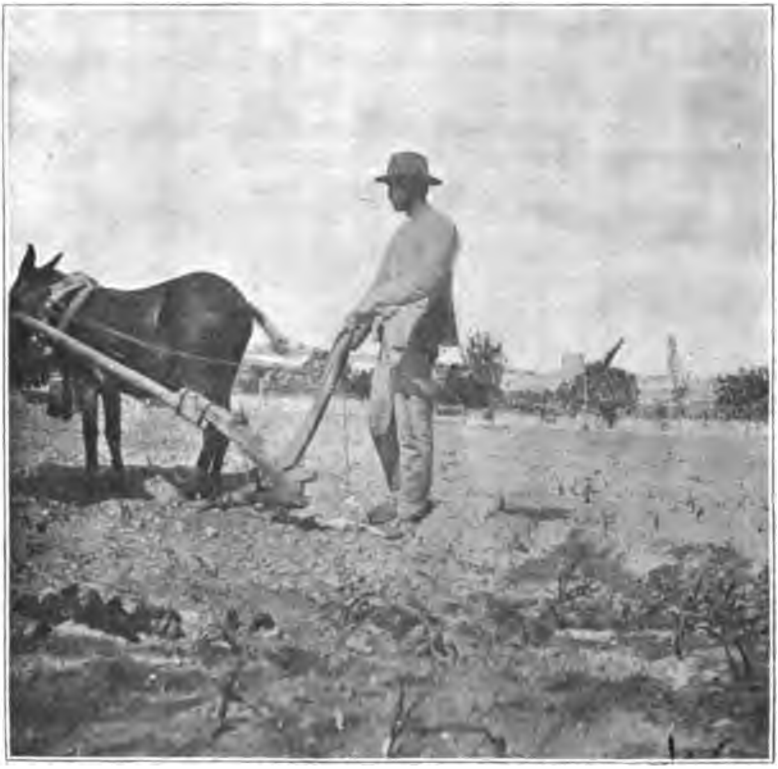


Fig. 7.—Plow in use in the Province of Barcelona.

ALMERIA.

(From United States Consular Agent Carleton, Almeria, Spain.)

HAND LABOR VS. MACHINERY.

Modern agricultural machinery can not be used to any extent in the Province of Almeria. The farms are small and the area suitable for cultivation is extremely limited. The single vega is small in acreage and can only be used for the production of garden truck. Again, a great deal of the available soil which might possibly be employed for the raising of wheat and barley is given over to grapes, and these form the great source of income to the farmers.

Most of the wheat and barley used in this Province comes from the districts of Granada and Jaen. Even with more attention paid to legitimate farming, modern implements would be of no use, owing to the mountainous conditions and the entire absence of any large farms. In the interior of the Province the mountain sides are spotted here and there with small cultivated spots, usually barley or wheat, where it would seem as if man or beast had a hard time in working.

In this city and its surroundings the daily wage is 28 cents. In the towns located in the vega 21 cents is paid, but during the harvesting of the crops 45 cents is demanded. In the interior the wage per day is still less and would not average more than 18 cents.

IMPLEMENTS IN USE.

As far as I can learn no modern agricultural implements of any kind have ever been employed in this district, and the chances for their introduction are small for reasons already indicated. In the Provinces of Granada, Cordoba, and Jaen, where there are large plains given over to the cultivation of wheat and barley, the opportunity is much greater. Some years ago several modern windmills were installed here, but these did not prove a success. The only kind now in use is the old-fashioned mill rigged with sails.

ROADS, ANIMALS, AND VEHICLES.

No vehicles or wagons from the United States have ever appeared in this city with, I believe, one exception, and that many years ago. The Spanish vehicle, generally called "victoria" here, is heavy and expensive, costing anywhere from $150 to $170 gold, and the American light, splendidly built buggy would undoubtedly be popular; but reckoning the duty, freight, etc., the cost would more than equal the locally made victoria.

A. E. CARLETON,
Consular Agent.

ALMERIA, SPAIN, *June 23, 1903.*

ANDALUSIA.

(*From United States Commercial Agent Price, Jeres de la Frontera, Spain.*)

AGRICULTURAL IMPLEMENTS IN USE.

In the district of Jeres de la Frontera, which contains an area of 356,000 acres, there are 251 farms, comprising the following acreages each: Ninety-five of 1,300 acres, 57 of 1,100 acres, 73 of 550 acres, and 26 of 330 acres—a total of 251 farms, comprising 234,930 acres of the total acreage of the district. On the 95 large farms wheat, oats, and barley are cultivated; the 57 farms of 1,100 acres each are largely pasture lands; the 73 farms of 550 acres each are planted in grain and vegetables; and the 26 smaller farms are devoted principally to olives. Besides these there are many orange, lemon, quince, almond, and fig orchards.

Although potatoes are an important feature of production, there are no such things as planters, cultivators, and diggers. In Spain the potato crop last year was valued at 119,000,000 pesetas

($17,000,000).* In this district there are 60 Walter A. Wood mowers, 25 English thrashing machines, and 300 steel and iron plows mostly of English manufacture, although inferior to the American plow. It is admitted by the intelligent farmers that of the agricultural implements used the American are far superior to the English and German, except the English thrashing machine, which they say is stronger, more durable, and gives better satisfaction than any other. In addition to the foregoing there are about 35 harvesters and binders in the district.

DEALERS.

There are no agricultural-implement dealers with established depots of such machinery. There are several agents for American, English, and German firms who make the sale of implements an incidental branch of their business. Within the last two months an English firm has established a supply house here for repairing thrashing machines. The question of cultivating vineyards with plows is a point of discussion among growers.

HOW TO INCREASE AMERICAN TRADE.

It seems to be agreed that the ground for vineyards can be prepared by plows for planting the vine stocks, but according to the present system the cultivation can only be done by hand labor. It remains, I think, for some intelligent and skillfull workman to exploit this field of achievable possibilities and radically change the present tedious and expensive task by the introduction of modern improvements in labor saving. It is also admitted that hand labor is not so cheap but that machines are found desirable and profitable.

The agent for the sale and introduction of new machinery should be an exceptionally good man—industrious and energetic. He must go out into the field and teach the farmers by actual demonstration the use and value of American implements. They need only to be shown how much time and money can be saved, to change their tedious and expensive methods to the rapid and cheap cultivation of modern scientific farming.

ROADS, ANIMALS, AND VEHICLES.†

Perhaps nowhere is there a more promising field for American agricultural machinery, as well as for the sale of wagons and vehicles of all kinds, as in this district. Heavy freight is now transported on rude two-wheeled carts, very cumbersome and unhandy, while lighter burdens and the market carrying of farm products are borne on the backs of men and women and in panniers upon burros.

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* The consul estimates the peseta at a fraction less than 14 cents, while the United States Treasury gives its value at 19.3 cents. The latter is the gold peseta; the former, the depreciated silver and paper peseta.

† In a supplementary report, dated June 26, Commercial Agent Price writes:

"I beg to add to my late report upon agriculture and machinery the statement that while the late treaty with Spain may not be a commercial one, yet since that treaty was made the duty on American agricultural machinery has been reduced from 18.50 to 12.50 pesetas per 100 kilograms, placing it in the same schedule of tariff as the Engish machinery. I make this explanation to prevent any misunderstanding. It seems to me that article 2 of said treaty classes our importations with those of the "most-favored-nation."

M. M. PRICE, *Commercial Agent.*

JERES DE LA FRONTERA, SPAIN, *June 17, 1903.*

ASTURIAS.

(From United States Acting Consular Agent Lovelace, Gijon, Spain.)

HAND LABOR VS. MACHINERY.

The land in Asturias is divided into small holdings and farmed by the owners and their families, outside help being very seldom required. In cases where help is needed laborers are hired at 2.50 to 4 pesetas (37.5 to 60 cents) per day.

IMPLEMENTS IN USE.

Modern agricultural implements are now coming into use. Turnwrest plows are being imported from the United States and Belgium in considerable and increasing numbers. Reaping machines are also imported, but owing to the mountainous nature of the country are not much in demand. Small, light horserakes, harrows, and cultivators would be in demand if actively introduced among farmers; also all implements suitable for the cultivation of maize and beet root.

AMERICAN IMPLEMENTS.

American agricultural implements are popular, but imported vehicles and wagons are unknown; although the homemade ones, it is thought, sufficiently meet the requirements of farmers, it would be well to make known any light vehicles manufactured in the United States for farm use.

HOW TO INCREASE AMERICAN TRADE.

The most effective means for increasing the trade in these articles would be for manufacturers to appoint agents and act on their suggestions as to improvements and modifications in the style of implements best adapted to the country.

DEALERS.

The following are respectable and trustworthy houses interested in promoting this business in Gijon: Otto Gerdtzen; Garteiz, Yermo & Co.; Hulton & Co.; and Morgan, Elliot & Co.

ARTHUR LOVELACE,
Acting Consular Agent.

GIJON, SPAIN, *May 9, 1903.*

BASQUE PROVINCES.

(*From United States Consular Agent Yensen, Bilbao, Spain.*)

AGRICULTURAL POVERTY OF THE PROVINCES.

The three Basque Provinces, as well as Navarra, Burgos, and Logrono, which are supposed to form the district of this consular agency, are the poorest crop producers in Spain, so that very little can be expected from them in view of introducing agricultural machinery and implements.

Vizcaya and Guipuzcoa are, as known, entirely mountainous, and the small spaces cultivated are so hilly that no mechanical implements can be applied to them with advantage.

Alava offers more flat land, but the soil is mostly poor, and as it is considerably elevated it often occurs that the crops do not ripen.

Navarra has a few fertile valleys, but it is not an agricultural country to be a market for agricultural machines.

Burgos is a very poor Province, but in good years it produces grain of different kinds, sometimes in quantities.

Logrono is considered to be the best of the five mentioned Provinces. It produces mostly wine, but also grain in some parts.

IMPLEMENTS IN USE.

Notwithstanding the barren condition of soil and climate, the board of provincial deputies (diputacion provincial) is now making efforts to instruct farmers how to cultivate their fields in a modern and more profitable manner and to that effect has established model farms (granjas) in every Province, under the inspection and management of an expert engineer with a staff of practical men.

These farms have been provided with some new implements of English, German, and American manufacture, and it is to be hoped that people will see their advantage in preparing the field, so as to use modern implements and machinery where these can be applied.

The McCormick Harvesting Company, of Chicago, is represented here by Messrs. Garteiz Hermanos Yermo y Cia., successors to Carlos Yensen, who in the last two years have imported quantities of machines for Valladolid, where they have a branch house and whence they distribute to the grain-producing counties.

Messrs. Herrera y Soriano, a recently established firm, have obtained the representation for the Plano Manufacturing Company, of Plano, Ill., and are now expecting their first stock of implements, which also, as far as I know, is destined for Valladolid and the Provinces in the middle of the country "Castilla."

These firms also import sowing machines for hand and horse power, plows, cultivators, horserakes, etc., of American and European types, although the latter is in minority, as the American are preferred for lightness and more work.

In thrashing machines, the English makers are building types more suitable for this market, and it is recommended that American manufacturers pay more attention to this line of machinery. Sizes not too large and heavy and with a special attachment for breaking or crushing the straw as it comes out of the machine, making it weak and soft for food for cattle, would find acceptance here.

HOW TO INCREASE AMERICAN TRADE.

The most effective means of popularizing American agricultural machinery and implements would undoubtedly be to open here a sample store, which would be of very little expense to the association desiring information, and if this idea should meet with approval I would be willing, in the capacity of United States consular agent, to find the right man and a good situation for premises at a very moderate expense—about $15 a month—to protect and inspect the exhibition and generally guarding the interests of the manufacturers. The articles would have to be delivered in good condition f. o. b. wharf here, and all other expenses, as customs duties, cartage, salaries, etc., would be on account of the firm in charge of the exhibition and the exclusive sale of goods as per samples remitted. Expenses for making propaganda all over the country would be divided equally between agent and manufacturers. Subagencies would have to be established at once, and the first one should be at or near Valladolid.

CARLOS YENSEN,
Consular Agent.

BILBAO, SPAIN, *June 26, 1903.*

CASTILE.

(From United States Consular Agent Odriosola, Santander, Spain.)

HAND LABOR VS. MACHINERY.

Land in Castile is in greater part devoted to the production of wheat, and during planting and harvest times laborers, especially reapers, are brought hither from Galicia.

While the wages paid are not large when it is considered that the labor is performed under the blazing sun, yet the uneasiness which such laborers create during their temporary stay is inclining the farmers toward machinery. The total helplessness of the landowners, by reason of their ignorance as to the uses of improved implements and machinery, and the greater ignorance of the farm laborers in the same regard—prejudice being added to ignorance in case of the latter—are the great drawbacks to the introduction of labor-saving agricultural implements into Castile.

This accounts for the slowness with which the different machines are being adopted, but several agriculturists who acquired some contribute to extend their use.

IMPLEMENTS IN USE.

Reversible plows are the most popular, especially those working superficially not exceeding a depth of 0.2 meter (8 inches), which are drawn by oxen in couples or by mules or donkeys; horses are not employed in this kind of work.

Great prejudices, which are fast dying out, have existed against mechanical sowers. The few landowners who use them, however, are well pleased with the results, it being estimated that they save 20 per cent in the seed alone, as compared with hand sowing.

Reapers are also being used. Preference is given to those which cut down and pile only, as those which bind the sheaves require greater power in handling and greater labor and loss of time in unsheaving, the thrashing being done in the fields and not in the barns or barnyards. Rakes to gather loose corn are very popular with those who have used them.

The system of wind winnowing is liable to cause great loss in case rain intervenes while this work is going on. This being acknowledged by the husbandmen, they are adopting ventilators to separate the grain from the straw after thrashing by the old system. These ventilators are perhaps the most popular of the agricultural implements used and are actually being made in several places in the interior, though the imported machines are far more perfect.

AMERICAN IMPLEMENTS.

In general, agriculturists having made practical experiments prefer American to English implements, though the latter have been most profusely offered. The agriculturists, noting that American machinery is better fitted for the uses for which it was intended, though not considered as strong as the English, give it the preference, as it requires less power to work it—a most decisive reason in this country, forced to rely on animal motive power.

HOW TO INCREASE AMERICAN TRADE.

The most practical means to be taken to increase American trade is undoubtedly the establishment of agencies with permanent exhibition of the implements and machines, affording visitors a practical illustration of the working of the same and the advantages to be gained by their use.

I think there is in Castile an ample margin for a moderate business, but I am of opinion that American manufacturers ought to establish active and intelligent agents in Valladolid, Burgos, Palencia, Leon, Salamanca, Zamora, and Medina del Campo. Fairs are held periodically in these towns, and the large gathering of husbandmen should be taken advantage of by exhibiting the different machines, so that agriculturists might be able to appreciate their worth.

FAUSTINO ODRIOZOLA,
SANTANDER, SPAIN, *May 11, 1903.* *Consular Agent.*

CORUNNA.

(From United States Consul Harmony, Corunna, Spain.)

HAND LABOR VS. MACHINERY.

The density and sobriety of the rural population of Corunna, Lugo, and Orense and the division of the soil into small plots or parcels are the chief causes of the low cost of agricultural hand labor, which scarcely attains 38 cents per diem. Moreover, hired hands for agricultural purposes are seldom needed, owing to the fact that the peasants, or farmers, very rarely possess lands or hold tenements of such importance as would require a greater amount of work than that which they and their own families would be able to carry into effect by means of the same sort of primitive implements used by their forefathers.

IMPLEMENTS.

In my opinion this rural population will resist for a long time to come the adoption of new methods and improved appliances. Yet efforts are being made here for the introduction of modern agricultural machinery by Señor Marcelino Alvarez Muñiz, the Government engineer placed in charge of the "Granja Experimental de la Coruña." So far, he has tried and recommended a few specimens of French manufacture, of which only one or two have been purchased in Galicia.

HOW TO INCREASE AMERICAN TRADE.

American agricultural implements, vehicles, and wagons are unknown in this district. The establishment of depots or agencies where these articles may be examined and their advantages explained is the only means I can suggest for any possible introduction of the same. Practical demonstration, if required, could be made at the Granja Experimental under the supervision of Señor Alvarez Muñiz.

DEALERS.

The leading houses here who would be most likely to be interested in the sale of imported agricultural implements are: Vinda de H. Hervada, Agustin Fernandez Morston, Fernandez y Forras, and Areal y Castro.

As for machinery, I know of no firm in this district, and am only able to name one in the vicinity of Galicia—Garteig Hermanos, Yarmo y Ca., Gijon.

JULIO HARMONY, *Consul.*

CORUNNA, SPAIN, *May 4, 1903.*

GALICIA.

(*From United States Consular Agent Mulder, Vigo, Spain.*)

HAND LABOR VS. MACHINERY.

In this district, and in fact in the whole Province of Galicia, land property is divided into small plots. Large farms are unknown, and there are but few farmers who own more than a couple of acres of arable land. Nearly every agricultural laborer is proprietor in a very small way and lives on the produce of his crops. Besides, hand labor is cheap, the wages of a farm hand varying from 2 to 2.50 pesetas (28 to 31 cents) per day. For these reasons the importation of agricultural machinery is out of the question.

IMPLEMENTS IN USE.

The implements used in preparing the soil, sowing or planting the seed, cultivating during growth, and harvesting or gathering the crops are of the most primitive description. Until recently these implements were generally made by local blacksmiths, but lately they have been imported from England and Germany, where manufacturers produce articles such as plowshares, sickles, scythes, rakes, hoes, etc., that suit the heavy and rocky soil and the crude taste of the cultivator.

AMERICAN IMPLEMENTS.

No modern American agricultural implements or vehicles are used in this district; the craggy country, the division of the land already referred to, and the nonexistence of practicable country roads exclude the possibility of using modern vehicles and wagons.

HOW TO INCREASE AMERICAN TRADE.

I am of opinion that American-made agricultural implements may be introduced here, but they should be made after the pattern of those in use in these parts and should compare favorably in quality and price with those imported from England and Germany.

DEALERS.

There are three firms in Vigo who deal in agricultural implements, viz: Pereira & Co., Eugenio Campos, and Blein Hnos., wholesale and retail hardware men.

ENRIQUE MULDER,
Consular Agent.

VIGO, SPAIN, *May 6, 1903.*

MADRID.

(From United States Vice-Consul Hallet, Madrid, Spain.)

HAND LABOR VS. MACHINERY.

The cost of hand labor in this district, and in fact in the whole of Spain, is small. Farm laborers earn from 1.50 to 2 pesetas (21 to 28 cents) per day, without maintenance, in the outlying villages of Old and New Castile. On the outskirts of the principal towns, such as Madrid, Valladolid, Guadalajara, Segovia, Avila, etc., their earnings are somewhat more—from 1.75 to 2.75 pesetas (25 to 39 cents.) At harvesting time gangs of laborers come from Galicia and Asturias to Old and New Castile to gather in the crops. They are not paid any regular wages, as a rule—that is to say, they are not paid by the day but by piecework. For instance, a contract will be made between them and a farmer for gathering in a field of wheat at a lump price to be paid when the work is done, the maintenance of the laborers sometimes being provided for and sometimes not.

Even these very low wages, in view of the poor quality and exceeding slowness of hand labor, would justify the use of labor-saving machinery by the agricultural and manufacturing interests of this district.

IMPLEMENTS IN USE.

Agricultural implements are used, but only to a limited extent; sowers or planters and cultivators are hardly used at all. Nearly all the portable steam engines, thrashers, sowers, and some plows come from England. A few fertilizers come from Germany and a few plows and grape and cider presses from France.

AMERICAN IMPLEMENTS.

American plows have had certain success in Spain—in this district, at least—and have a good reputation as serviceable and relatively cheap implements, whose advantages as compared with English plows (which are too heavy for the soil and conditions here) are generally recognized. One or two sowers of American manufacture have been sold. American harvesters—Deering and McCormick make, the former represented in Madrid and the latter in Valladolid—are becoming popular. I have learned on good authority that more than 160 Deering harvesters alone were sold last season in this country. The sale, however, of American harvesters, I have been told by a competent and responsible party, has only commenced and is capable of much extension. A firm in Madrid dealing in agricultural implements represents a harvester of Canadian manufacture. Rakes, forks, and other small agricultural implements of American manufacture would have a larger sale if pushed more energetically.

ROADS, ANIMALS, AND VEHICLES.

As to vehicles and wagons made in the United States, I am sorry to say that I do not know of anyone who has attempted to sell them in this district. Inquiries have been received at this consulate from manufacturers asking for the names of dealers, but the result, so far as I know, has been nil. It is necessary, if any trade in this line is to be gained, to establish an agency and have showrooms where the goods can be exhibited, so that orders may be given from samples.

HOW TO INCREASE AMERICAN TRADE.

The most effective means of introducing or increasing the trade in all articles in question is by establishing agencies or appointing agents who will represent American goods exclusively. The large dealers in this city already represent the manufacturers in this line of England, Germany, and France, and in some cases of Belgium, and have exclusive agencies in Spain for specified goods manufactured in those countries—of course, on the condition that they do not sell similar machines or implements of any other maker.

Spaniards are very conservative, and it is with the greatest difficulty that they can be induced to discard the old for the modern. In many regions the subdivision of the soil is great, which would not permit modern and somewhat costly machinery to be purchased for profitable employment, even leaving out of consideration the fact that where such subdivision does rule the agricultural population is in a most miserable condition and unable to make such purchase, unless by very small installments.

The Government experiment station, 3 miles from the center of Madrid—in which is situated the Instituto Agricola de Alfonso XIII, attended at present by about 200 students—possesses two Deering harvesters and one sower of the same manufacture. All the other implements, etc., in its possession, with the exception of two German fertilizers and one or two French plows, came from England. If American plows, planters, cultivators, rakes, forks, etc., could work their way into this experimental station, it would be a splendid advertisement, for the students at the Instituto, who are taught practical farming and who are, almost without exception, the sons of wealthy landowners, return to their homes when their studies are completed, propagating the use of the implements and machinery they know how to use and saw in use at college and which had been accepted by such college as the best, most modern, and best adapted to Spanish conditions.

H. H. HALLET, *Vice-Consul.*

MADRID, SPAIN, *June 21, 1903.*

MALAGA.

(From United States Consul Birch, Malaga, Spain.)

IMPLEMENTS IN USE.

The present condition of the rural sections of the Province of Malaga seems to hold out but little encouragement for the introduction of agricultural implements of American manufacture. I make this statement after having visited several vineyards and wheat and barley growing farms in and about the city of Malaga. Both classes of farms were visited—those owned and worked by persons whose sole income is derived from the resultant crops and the other and more extensive places operated on a large scale by men whose names are synonymous with all that pertains to the active business life of Malaga, and to whom the field product represents but a small portion of their respective incomes.

The farming people here, as a rule, are representative of that class who are seemingly content to work their lands with the old materials, being distrustful of innovations and believing that the best results can be obtained at less cost by the use of grotesquely antique tools that they know to be capable of performing the necessary work. The "escardillo," used in the wheat field; the "chapulina," with which the earth surrounding the grapevines is tilled; and the "soleta," put to effective use in the cornfield, are somewhat similar in shape and purpose to the American hoe, but with shorter handles for one-hand use, and of varying widths. These instruments appear to be sufficient for all purposes, and I am told that each laborer must provide his own set of hand tools, which he carries to and from his home.

Wheat and barley are cut with an ordinary sickle, and then laid upon a flat plot of ground and thrashed. This is accomplished by running a "trill" (a knifeboard about 2 by 6 feet), drawn by two horses and operated by a boy, who stands upon the trill as the horses draw it over the surface of the grain.

Plows used on these farms are made entirely of wood and are drawn by oxen.

Each of the foregoing-mentioned instruments are identical, I am reliably informed, to those used here two thousand years ago.

In one place I saw a steel plow of English make lying neglected in the rear of a small barn. The farm hands explained this condition by saying that it was not as practicable as the old style.

On the lands of an extensive sugar-cane, wheat, and barley grower modern implements of English and French design and manufacture were in use. These included plows, cultivators, harrows, and grain-planting machines. Nowhere could I find an American machine of any description. The reaper and binder, corn harvester, etc., are practically unknown, and my observations lead to the belief that if any attempt is to be made to introduce the American article in the farming district of this section of Andalusia, the effort should be confined to the larger plantations and to convincing the operators of the pronounced labor-saving advantages of the last-mentioned machines.

HAND LABOR VS. MACHINERY.

The ordinary laborers in the fields around and about Malaga are paid from 25 to 28 cents for a working-day of eight hours, so that it would seem that the Malaga farmer is not yet willing to lay out much money in devices unknown to him. Persons who know the character of the Malaga farmer say that he is loath to depart from beaten tracks unless assured of immense benefits.

HOW TO INCREASE AMERICAN TRADE.

Thus, the only practicable method of introducing American agricultural machinery appears to be the sending of agents conversant with the language and customs of the people into the country districts with catalogues printed in Spanish, and if possible exhibiting samples of their wares.

The only agricultural implements of any kind on sale in the Malaga stores are corn crackers and feed cutters of French make. These merchants, of whom there are five, say that there is but little call for field machinery, and when it is desired by the wealthier growers the latter import direct either from a French or English manufacturer.

DEALERS.

The five Malaga dealers in agricultural implements are: Arribere y Tascual, Sta. Maria, 13; Julio Goux, Especerias, 22; José Guerrero, Martinez, 14; Antonio Luque, Compañia, 45; and Pedro Temboury, Marques de Lairos, 6.

Within the past few months Bartolome Cerro, a Malaguerian, has secured the agency of an American agricultural-implement firm, but up to date he informs me that he has accomplished but little. Señor Cerro has Spanish catalogues and expects in a short time to tour the interior of the Provinces of Malaga and Granada, where he anticipates doing some business.

I was unable to learn the prices paid for the different English and French machines, but am informed that Sociedad Anonima de Altos Hornos, a Belgian iron establishment, is making plows for current sale at about $10.50.

ROADS, ANIMALS, AND VEHICLES.

With respect to the opportunities for the introduction of American vehicles for use in and about Malaga, the best information I can present is probably the cost of the prevailing Spanish conveyances for comparison with American figures.

The carts used for carrying petroleum barrels, filled with olive oil, and almond and raisin boxes from the various local storehouses to the quay are substantial but crude affairs that are manufactured and sold here for about $90; strong four-wheeled iron-side wagons put to country-road use, $215; the ordinary phaeton, used quite extensively as private equipages by the wealthier class here, are sold for about $357; the street cabs, of which over 300 are in daily use, are made here and cost $428; a private coche, with sumptuous fittings, now in course of construction, will bring the builder about $715; while dogcarts sell at about $125.

These figures were obtained from Manuel Ramirez, practically the only carriage builder in Malaga, who, consequently, enjoys almost a monopoly of the trade and can name his own figures. Señor Ramirez frankly admitted to me that better vehicles could be had at less cost in the United States, but that the prevailing customs duty is considered prohibitive alike by American importers and Malaga purchasers.

American manufacturers of sprinkling wagons or watering carts may be interested in learning that one of the greatest needs of Malaga is a practical method of watering the streets and minimizing to some extent the clouds of dust that whirl through the principal highways and the park. Wholly inadequate watering carts sold for $71.50, and sprinkling hose are the only methods now in vogue. I think it quite probable that the municipal authorities would seriously consider offers of adequate watering wagons.

D. R. BIRCH, *Consul.*

MALAGA, SPAIN, *June 25, 1903.*

SEVILLE.

(*From United States Consular Agent Saberton, Seville, Spain.*)

HAND LABOR VS. MACHINERY.

Near Seville it has hitherto been the custom to pay hand labor partly in cash and partly in food, but now payment entirely in cash is becoming much more frequent. The cost to the farmer per day for a field hand may be estimated at from 1.50 to 1.75 pesetas (21 to 25 cents) in ordinary months and from 4 to 5 pesetas (56 to 70 cents) during the harvest. Though these wages are not high, I am decidedly of opinion that there exists here a great field for the use of labor-saving agricultural machinery, since the corn lands are very flat and without hedges or ditches.

IMPLEMENTS IN USE.

Thrashing machines are used to a limited extent, but the old system of beating out the grain by driving colts and mares around in the open thrashing floor is still generally prevalent. With the exception of some half a dozen farmers, who have chiefly English implements, no one here uses really modern agricultural machinery.

AMERICAN IMPLEMENTS.

American implements are not sold as yet in any quantity in this district. If manufacturers would send properly qualified representatives to open up the trade and to appoint reliable, energetic local agents, I feel certain a good result would be obtained.

HOW TO INCREASE AMERICAN TRADE.

It is of very little use to send catalogues in the expectation that Spanish farmers will buy without having seen the goods. The land is, as a rule, divided into extensive farms, which are cultivated by the owners who reside in Seville or some other large town. Owing to the many recent strikes of the laborers all over Andalusia and the consequent raising of wages, the wealthy landed class is on the lookout for labor-saving machinery. The concentration of the farming class in the towns should considerably diminish the expenses of the manufacturers' representatives and at the same time permit of fairly large stocks being held by the local agents.

DEALERS.

The following firms, all in Seville, would very likely promote the importation of implements, etc.: José Trotter, Resolana, 36;

R. Garcia, Calatrava, 1 and 3; E. Balbontin, Goles, 23; Rodriquez & Co., Yuske, 16; M. Gross, Trastamara, 19; and Perez Hnos., San Vicente, 81.

WALTER SABERTON,
Consular Agent.

SEVILLE, SPAIN, *May 7, 1903.*

TARRAGONA.

(From United States Consular Agent Agostini, Tarragona, Spain.)

HAND LABOR VS. MACHINERY.

Although the cost of hand labor is very low in this district, the introduction of improved agricultural machinery might naturally reduce the proportion it represents as a factor of the entire cost of production, if the topographical configuration of the country allowed of its use. Overlooking the subdivision of landed interests among small owners as an impediment, since this might be counterbalanced by the clubbing together of a certain number or by the formation of enterprises for applying the improved machinery to the various estates in succession, the insurmountable hindrance is the mountainous, rugged, and broken surface which the country presents, rendering impracticable the employment of harrows, plows, reapers, mowers, or other similar machines and implements, which as a rule are constructed to work on level or uniformly undulating plains. Here the laborers have raised artificially level patches on the steep hillsides by bolstering up with stone walls the earth hauled thither.

IMPLEMENTS IN USE.

Modern agricultural implements command acceptance so far as they are applicable to the conditions of the land. Improved hand plows with double and reversible shares, to be drawn by one mule or horse and weighing only about 40 pounds, are just now in great favor, being so contrived as to avoid the constant dip of the share into the soil that causes a continual strain and loss of labor to man and beast in the old-style plows. These plows are of French invention and production.

AMERICAN IMPLEMENTS.

The only American machine which has been imported here, so far as I know, is a steam pump for exhausting a very considerable spring of water in a lead mine, and which has given great satisfaction. Industrial machinery for mining and for manufactories of common papers and textile goods might find a limited opening here. In the adjoining Provinces of Barcelona and Lerida—the former of which contains extensive plains, sloping gently to the seaboard, while the latter holds between its ranges of hills valleys of considerable extent—American agricultural machinery has actually been tested, though on a limited scale.

HOW TO INCREASE AMERICAN TRADE.

The staple products in this Province being wine, filberts, and almonds, the growing of grain stuffs holding a very subordinate place, there is not much opening for the introduction (direct) of American improved machinery. As to the elementary implements in use—spades, picks, shovels, etc.—Bilbao now places on this market implements as good as, and far cheaper than, those formerly imported from England and France.

DEALERS.

There is but one Tarragona firm, Mr. Marcelino Vicens, engaged in this line of trade. He is constantly traveling through the Province to bring his business directly to the attention of the farmers, vine growers, etc., it being the result of his many years' experience that it is useless to bring any of the proposed innovations to Tarragona, inasmuch as the landowner or tenant who might take it into his head to make a trial of any improved kind of mechanical appliance in the shape of improved machinery would never come to Tarragona to supply his needs—this being held to be an out-of-the-way place—but would go to Barcelona, where many foreign manufacturers are either represented or have branch houses established, whence the demands not only of the whole of Catalonia, but also of Aragon and even of Valencia are supplied. Besides the advantage of doing business profitably, he is allured to Barcelona by the incentive of sight-seeing.

LOUIS G. AGOSTINI,
Consular Agent.

TARRAGONA, SPAIN, *May 8, 1903.*

VALENCIA.

(From United States Vice and Deputy Consul Byrne, Valencia, Spain.)

HAND LABOR VS. MACHINERY.

There is but a very limited demand in this district at present for foreign-made agricultural implements and vehicles of any kind, owing to the comparative cheapness of labor, the abundance of raw material, the unsuitability of foreign shapes to the tastes and requirements of Valencia farmers, and the existing tariff.

Modern agricultural machinery is not employed. The partition of the soil into small farms of 5 to 12 acres and its subdivision into even smaller plots, devoted more to fruit growing and market gardening than to general agriculture, almost preclude the use of labor-saving machinery in this fertile region around Valencia. The area under rice is, however, yearly increasing and special machinery for preparing the soil and planting and harvesting rice would undoubtedly find a ready market here, now that wages are steadily advancing. Farm laborers in this district now earn 2 pesetas (28 cents) in winter, 2.25 pesetas (31½ cents) in spring, and 3.50 pesetas (49 cents) in harvest time. These rates represent an advance of 30 per cent on wages current two years ago, and are turning the attention of large farmers effectually toward machinery.

AMERICAN IMPLEMENTS.

Ten Chicago-built harvesters have just been imported here and as they are going to be tested on the vast wheat plains of La Mancha under conditions favorable for demonstrating their economic value, the experiment will no doubt be followed by importations on a larger scale.

IMPLEMENTS IN USE.

A thrasher experimented with last season in the rice fields was not considered an unqualified success. Its owner offered it gratuitously to farmers who would pay for fuel and wages of attendant machinist, but very few availed themselves of the offer. The objection to the thrasher was that it deteriorated, shelled, or destroyed 2 to 3 per cent of the grain. This loss was sufficient to pay for the hire of a horse or mule, which in the busiest season does not exceed the equivalent of $1 per day. The horse is trotted over the rice or wheat sheaves arranged in concentric circles on an open-air thrashing floor, and in this primeval fashion thrashes 1,000 pounds of rice daily without, it is claimed, injuring a single grain.

ROADS, ANIMALS, AND VEHICLES.

In vehicles, a uniform type of two-wheeled carts are employed in the district for the cartage of wine, fruit, rice, etc., to the port. Strange to say, although there is railway communication traversing the region in different directions and converging to the port, the service is so defective, freights so high, and rolling stock and plant so scarce that more than two-thirds of the produce exported still reaches the quays on carts. These carts, without being heavy, are a marvel of strength, adapted for the roughest roads. They are all handmade, even to the iron shoeing of the wheels, and so great is the demand that every village has a couple of factories. A skilled cartwright earns the equivalent of 50 cents and apprentices 14 to 20 cents per day. The best quality of freight carts, with movable awning and sides constructed of alternate rods of iron and oak, arranged perpendicularly, can be had to order at the following prices:

1-ton cart (1 horse)	$49.00
2-ton cart (2 horses)	59.50
3-ton cart (3 horses)	80.00
4-ton cart (5 to 6 horses)	105.00

The horses draw in single file.

DEALER.

Carsi & Co., Ovalo, Grao, Valencia, is the only firm trying to introduce agricultural implements and machinery into this district at present.

JOSEPH L. BYRNE,
Vice and Deputy Consul.

VALENCIA, SPAIN, *June 24, 1903.*

SPANISH DUTIES ON IMPORTS FROM THE UNITED STATES.

The Commercial Agent at Jeres de la Frontera, Spain, in his report on agricultural implements in his district, stated that in his opinion the commercial treaty recently concluded between the United States and Spain permitted all imports from the United States to enter that Kingdom under the most-favored-nation clause. The question was called to the attention of the Department of State, which responded as follows:

> The understanding of the Department of State is that all goods from the United States are required, upon importation into Spain, to pay the rates of the general or maximum tariff—that is, the rates in the first column of the official tariff—while the same goods from almost all European countries enjoy the lower rates of the conventional tariff, published in the second column, and this by virtue of special reciprocity treaties or stipulations for the most-favored-nation treatment.
>
> An examination of the last edition of the tariff of Spain (law of December 26, 1899), published in the International Customs Journal, as well as the ten supplements, down to May, 1903, shows no warrant for believing that American agricultural implements are admitted into Spain at privileged rates.
>
> The recently concluded commercial treaty between the United States and Spain (not yet ratified) does not contain the most-favored-nation clause in respect to imports and exports. Consequently, no tariff reductions could be expected in favor of the United States upon that treaty as a basis.
>
> Article II of the treaty of friendship between the two countries which guarantees reciprocal liberty of commerce, etc., has no bearing on the question.

SPANISH CUSTOMS TARIFF.

United States Consul Bartleman, of Cadiz, Spain, supplies the following information covering the duties imposed on agricultural machines and vehicles entering, per 100 kilograms (220.46 pounds):

Tariff No.	Article.	First tariff.	Second tariff.	Mode of collection.
		Pesetas.[*]	*Pesetas.*[*]	
297	Agricultural machines[†]	18.20	14.00	Gross weight.
298	Motor machines of all kinds with or without boilers, imported separately.	21.60	18.00	Do.
312	Carts and handcarts		53.00	Net weight.

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[*] Consul Birch, of Malaga, estimates the peseta at 14 cents.

[†] The machines included in this number are those employed by farmers and agriculturalists for preparing the ground and gathering the crops, as also those employed in order to clean and improve the crops without essentially changing their nature. Landlords and tenants who at present enjoy the advantages of the law of June 3, 1868, shall pay on agricultural implements and machines an import duty of 1 peseta per 100 kilograms. For this purpose, however, the importer will undertake to pay the higher tariff rates unless, within a reasonable time to be fixed by the customs authorities, he produces a certificate signed by the mayor of his locality specifying the denomination, class, and weight of the agricultural implements and machines therein referred to, and also showing that the same are in the agricultural colonies for which they were intended, together with a further certificate from the proper authorities to the effect that the colony in question is within the required conditions to entitle it to the privileges of the aforesaid law. If he fails to produce these two documents, he will have to pay the full duties provided in the tariff.

SWEDEN AND NORWAY.

NORWAY.

(*From United States Consul-General Bordewick, Christiania, Norway.*)

HAND LABOR VS. MACHINERY.

Owing to heavy emigration and a tendency among the population of the rural districts to flock to the towns, the purchase of agricultural tools and implements is considered a paying investment on the larger farms in Norway. The hard times which have prevailed in the country during the last three years have caused some of the country people to return to the farms; but as emigration has been unusually large during the same period and still continues unabated, farm laborers are scarce. The emigration drains the country of a large percentage of the people best fitted for farm work.

Wages paid farm laborers are low. The farmers pay their hands for a year's work 150 to 300 kroner ($40.20 to $80.40), with board and lodging. Day laborers in the country obtain 1.68 to 2.70 kroner (45 to 65 cents) per day, without board, and in the cities and towns 1.75 to 3 kroner (47 to 80 cents).

AGRICULTURAL IMPLEMENTS IN USE.

Labor-saving machinery has for many years been in use by the agricultural as well as by the manufacturing interests of the country, especially during the last decade.

Plows and harrows are in general use and are to a large extent manufactured in Norway. Modern agricultural implements, such as seeders, mowers, reapers, and thrashers, are in use on all the larger farms. Some of these are manufactured in Norway, but the larger portion is imported. The importations in 1901 were:

	Kroner.	
Reapers and mowers	343,700	=$92,100
Other farm machinery	511,500	=137,100
Total	855,200	=229,200

The countries from which this machinery was imported were as follows:

	Kroner.	
United States (direct)	217,600	=$58,300
Great Britain*	242,200	= 64,900
Germany	55,000	= 14,700
Sweden	269,400	= 72,200
All other countries	71,000	= 19,100
Total	855,200	=229,200

Steam thrashers are but little used owing to the smallness of the farms. None are made in Norway and only two were imported in 1901.

The vehicles used here are nearly exclusively of home manufacture. Some wagons and carriages are even exported.

HOW TO INCREASE AMERICAN TRADE.

American agricultural tools and implements are very popular in Norway and the trade is in good hands. I see at present no way to materially increase the trade with profit to the American manufacturers. The American goods are well introduced and the competition is mainly in prices. Norway is a small country and its need for agricultural machinery limited.

DEALERS.

Of principal dealers I will name:

S. H. Lundh & Co., Jernbanetorvet 4, Christiania.
Heyerdahl & Co., Steners gade 1, Christiania.
And. Hollingworth & Co., Steners gade 8, Christiania.
Maskinkompagniet, Nygaden 4, Christiania.
O. Mustad & Son, Kongens gd. 3, Christiania.
M. Negaard & Co., Nygaden 9, Christiania.

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*Of the farm machinery set down as coming from Great Britain, I have reason to believe that a considerable portion represents American goods in transit.

E. Sunde & Co., Torvgaden 11, Christiania.
Werners Maskinforretning, Palábryggen, Christiania.
Gunnar Birkeland, Drontheim.
Annas Berle & Co., Bergen.
Einar Blaauw, Bergen.
Alfr. Knudsen, Bergen.
J. Rasmussen & Racine, Stavanger.

Some of the Christiania houses operate branch stores at Bergen, Drontheim, and Stavanger.

DUTIES.

There is no import duty levied on agricultural implements.

HENRY BORDEWICH,
CHRISTIANIA, NORWAY, *May 13, 1903.* *Consul-General.*

SWEDEN.

(From United States Consul Bergh, Gothenburg, Sweden.)

HAND LABOR VS. MACHINERY.

The cost of hand labor in Sweden has for many years past been slowly but steadily increasing. This applies to the rural districts as well as to cities, partly on account of the influx of young farm hands to the towns and cities and partly on account of the emigration; also by reason of the general tendency to an increase in the cost of the necessaries of life. In many parts of Sweden the farmers complain that they are unable to pay the wages now demanded by the farm hands, female as well as male. In manufacturing places strikes for higher wages are not uncommon, and a large number of the workmen have joined in unions for striking purposes.

For the above-mentioned reasons it is safe to say that the cost of hand labor is in Sweden sufficiently great to justify the use of labor-saving machinery by the agricultural and manufacturing interests.

IMPLEMENTS IN USE.

American agricultural implements, particularly manure forks, hayforks, horserakes, mowers, and reapers, have been well known in this country for a good many years past, and recently other implements have come into use. Their popularity is proved by the fact that implements of similar patterns are now to some extent manufactured in this country.

The more expensive implements or machines, like mowers and reapers, are used mostly on large farms or country estates. On small as well as on large farms plows of different models are used; also harrows, cultivators, seeders and grain drills of different kinds, land rollers in one piece or in sections, phosphate spreaders, horse hoes, horserakes, manure forks and hayforks of steel, straw-cutters, grain cleaners, thrashing machines for horsepower, etc.

The facts may be slightly different for different parts of the country, but for the southern and central parts of Sweden it may be said that the plows used are partly made in Sweden, while some are imported from Germany and a considerable number from the United States. Some cultivators and harrows are also imported from the United States, but are mostly made in Sweden. Seeders of different models are imported mostly from Germany; some small crank seeders come from the United States, while others are made in Sweden; land rollers are made in Sweden; phosphate spreaders are German, but some of American manufacture may soon be introduced here; horse hoes are partly Swedish and partly American; mowers are partly Swedish and partly American; reapers are mostly American; horserakes are made in Sweden and also imported from the United States; straw-cutters are Swedish; seed cleaners are partly Swedish and partly German. Manure forks, hayforks, hoes, spades, shovels, and scoops are imported from the United States, but are now made in considerable quantities in Sweden. The same is the case with the handles for said implements or tools.

AMERICAN IMPLEMENTS.

American machinery and implements from first-class firms are popular here, as stated above, but as the balance of trade seems to be somewhat unfavorable for Sweden, and as the patriotic sentiments apparently manifest themselves more now than a few years ago, certain consumers prefer to favor the home industry as far as consistent with their individual interests. Still, the import of American machinery, implements, and tools is considerable and will undoubtedly continue to be so as long as American ingenuity and rational manufacturing and merchandising methods prevail in our country.

Some vehicles are imported, but in comparatively small quantities. Private persons may now and then import single vehicles for their own use. American buggies may be seen here, but not often; also speeding carts. I do not think that American farm wagons are in this market at all. The general belief here seems to be that American vehicles and wagons are too light and not strong enough for use on the Swedish roads or on the uneven ground of the Swedish farms. This may in a great measure be only imagination. When the American manure forks and hayforks were first sold here, many farmers refused to buy them because they were convinced that the slender tines would not hold; since the farmers became accustomed to these light and handy implements, they will not have any others, or at least they must have something like them.

VEHICLES.

Carts are used on small farms, and are often made by the farmer himself and finished by the village blacksmith. On larger farms wagons may also be in use, but are made in Sweden; they are, from an American point of view, rather primitive affairs. The same is the case with the lumber wagons used in this part of the country. In the cities a better class of wagons and carts are made and are used by brewers, grocers, building contractors, coal dealers, and others. Here are also factories for the manufacture of hubs, spokes, and finished wheels.

HOW TO INCREASE AMERICAN TRADE.

To send out traveling salesmen of ability, with good technical training and conversant with the Swedish language, would probably be effective in introducing and enlarging American trade. To establish permanent expositions would probably pay, but they would be expensive also. To send out illustrated catalogues, giving actual wholesale prices, might be useful if the catalogues fell into the hands of the right persons. A good way is to enter into correspondence with importers of machinery in general. In certain cases it may be even better for the manufacturer to appoint an active and reliable Swedish merchant as sole importer for the whole of Sweden. This general agent will then—knowing that he has a wide field for his operations, and that there may be some profit in it—usually find it to his advantage to push sales by advertisements and through his own traveling salesmen. This method is also used by certain manufacturers; but the difficulty is to find the person who has all the desirable qualifications, viz, activity, capital, responsibility, and prominence in the business world. In my opinion, certain Swedish business houses do not advertise enough, and the prominent ones do not like to work for the introduction of a new article unless good profit is absolutely certain.

American inventors and manufacturers ought to be well informed about the patent laws of other countries, and they could then possibly make some arrangements to stop undue imitation of their models.

DUTIES.

The import duty on agricultural machinery and implements is 10 per cent ad valorem, and the import duty on vehicles and wagons, or parts thereof, is 15 per cent ad valorem.

LIST OF DEALERS.

The following is a list of certain Swedish merchants who are or might be interested in the import and sale of American agricultural machinery and implements:

Aktiebolaget Andrew Hollingworth & Co., Örebro, Sweden; branch offices in Eslöf, Sweden, and Christiania, Norway; general agents for Walter A. Wood's mowers and reapers and for Rud. Sack's grain drills and Oliver's plows; are also manufacturers of dairy apparatus, thrashing machines, etc.

E. Svedberg, Maskinaffär, Örebro, Sweden; sells mowers and reapers, horse-rakes, hay tedders, cultivators, etc., from D. M. Osborne & Co., Auburn, N. Y.; steel plows from Deere & Co., Moline, Ill.; also all kinds of machinery, motors, etc.

Skånska Maskin-och Redskaps-Affären, A. Paulson & Co., Eslöf, Sweden; agents for reapers and mowers.

Anderson & Mattson, Malmö, Sweden; harvesting machinery.

John Trägårdh & Co., Gothenburg, Sweden; prominent machine merchants; do not now handle agricultural machinery, but desire to start business in this line.

Fraenkel & Hedenberg, hardware merchants, Gothenburg, Sweden; American hand seeders, "Planet Jr." seed drills and weeders, lawn sprinklers, insect exterminators, and general hardware.

General machine merchants.

Aktiebolaget Göteborgs Maskinaffär, Gothenburg, Sweden.
Gust. Bolander & Co., Gothenburg, Sweden.
John Trägårdh & Co. (see above), Gothenburg, Sweden.
Wilh. Sonesson & Co., Malmö, Sweden.
Erik Schweder & Co., Malmö, Sweden.

ROBERT S. S. BERGH, *Consul.*

GOTHENBURG, SWEDEN, *May 19, 1903.*

SWITZERLAND.

(*From United States Consul Gifford, Basel, Switzerland.*)

HAND LABOR VS. MACHINERY.

It is only within a few years that the cost of hand labor has been sufficiently great to make the use of labor-saving machinery profitable in the manufacturing and especially in the farming districts of this country. But there has been a great and sudden change in this respect, and to-day the silk-ribbon looms in the scattered farmhouses of the Canton of Basel Land, which have been so long worked by hand in the leisure hours of the inmates, are now driven by electricity.

AGRICULTURAL IMPLEMENTS IN USE.

On the fields a much more surprising change has taken place. The individual holdings of land are so small in Switzerland and farm labor has been so cheap that it was thought not very long ago that improved agricultural machinery could never be used with advantage. Mowing machines and horserakes have, however, suddenly appeared even within the city limits of the little Canton of Basel, while such machines are now to be seen everywhere in the agricultural Cantons of Basel Land and Solothurn, and particularly in the adjoining Alsatian and Baden communes. This year mowing competitions to test the value of rival machines have been held in some of the latter towns with the natural result of the triumph of a genuine American mower.

In the agricultural Cantons of this district there are in use, besides mowers and horserakes, the following agricultural implements: Hay tedders, modern plows, harrows, cultivators, and harrows and plows especially designed for use in vineyards. A very ingenious potato planter is only sparingly used here, but is useful in the Canton of Berne, where more attention is paid to that crop. To complete the list there should be mentioned feed and vegetable cutters, grape and food presses, and thrashing machines.

The value of these implements imported in 1902 was $230,000—a considerable decrease as compared with the two previous years. Germany furnished about two-thirds of all the plows used in the country and sent nearly the same proportion of all the imported implements, the remaining third being furnished in about equal proportions by the United States and France, with a slight advantage in favor of the latter country.

COUNTERFEITING AMERICAN MACHINES.

In Switzerland the Maschinen und Eisengiesserei Schaffhausen, Aebly, in Burgdorf and Marti, in Winterthur, are prominent manufacturers of agricultural machinery, and even of "American machinery," for American machines of all kinds, and especially agricultural machinery, are very popular here. The perseverance and success with which German and Swiss imitators have reproduced American models accounts, no doubt, for the decrease in the importation of such wares during the year 1902. The leading dealer in this city says frankly that "all these machines have been invented in the United States." Certainly this is no revelation, but it is interesting, if not gratifying, to learn that, with the exception of mowing machines, the German and Swiss imitations or reproductions tend to exclude the original inventions from the market. As the authority above cited expressly declares: "Our people first introduce the American machine entire, then the detached parts, which they learn to put together in a proper manner; finally they learn to make some of the parts, and at last all of them, thus coming to construct a machine that is as good as the original and a little cheaper."

As an example of the success which has attended "the manufacture of American implements" with slight changes in construction, there may be cited the case of the hay spreader. The prospectus herewith inclosed declares—

> The Osborne tedder, which we were the first to construct in Switzerland in the year 1895, has had extraordinary success. * * * The original American machine has been reconstructed by us and strengthened and improved in all its parts. Our tedder is entirely made of steel. The frame is stronger than that of the American article, and is riveted instead of fastened with screws.

A horserake, of which an illustration is given in a prospectus, also has a singularly familiar appearance, but the seller merely praises its advantages without hinting at a foreign origin.

HOW TO INCREASE AMERICAN TRADE.

The most effective and the only means of increasing the trade in American agricultural implements is to furnish at lower prices as good machines as are made here or in the adjoining countries, or to offer better wares at the same price. As has again and again been explained in reports from Switzerland, there is absolutely no prejudice against our manufactures and products in this country. On the contrary, other things being equal, a preference would be given to anything in the mechanical line coming from the United States, for it is assumed that the people of that country have a special capacity for useful inventions.

DEALERS.

Among the houses in Basel that would be interested in promoting the sale of American machinery may be mentioned: Brodman & Erzer, 5 Binningerstrasse, and Eugen Soller, 43 Clarastrasse.

DUTIES.

The present duty on agricultural implements is 4 francs (77 cents) per centner (220 pounds). This rate is exactly doubled by the law voted by the Swiss Chambers and approved by the people; but no definite time is fixed when this highly protective measure is to go into operation. In the opinion of the best-informed people in the country it will never be applied in its rigor, but merely serve its avowed purpose of exerting a pressure on the countries with which new commercial treaties must soon be concluded.

VEHICLES IN SWITZERLAND.

Since the report on vehicles made in 1900,* the only supplementary fact of importance is the steady increase of interest in automobiles. There are now perhaps fifty of them in use in this city alone, all of them sporting or pleasure carriages, the favorite seeming to be a 4-horsepower Dion-Bouton, with seats for three persons and costing about $700. There are, of course, many other types in use, one of them manufactured by F. Martini & Co., in Frauenfeld.

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*Printed in Vol. XXI, part 2, of SPECIAL CONSULAR REPORTS, Vehicle Industry in Europe.

A more practically useful experiment is that of E. Soller, of this city, who has for some years been engaged in perfecting a traffic motor which may prove the first successful effort in this country to use the new car for hauling merchandise.

It is regarded here as not only probable, but desirable, that the present automobile sport will prove to be merely a transition stage, serving to perfect a machine that shall in time carry a good part of the world's loads and relieve both horses and men of their burdens.

GEO. GIFFORD, *Consul.*

BASEL, SWITZERLAND, *May 30, 1903.*

UNITED KINGDOM.

ENGLAND.

(*From United States Consul-General Evans, London, England.*)

HAND LABOR VS. MACHINERY.

The cost of hand labor is sufficiently great to justify the use of labor-saving machinery.

AGRICULTURAL IMPLEMENTS IN USE.

Modern agricultural implements are universally used. One-third of the harvesting machinery used here is of English manufacture, while the rest is manufactured in the United States and Canada.* Fully two-thirds of the implements for preparing the soil, cultivating, and seeding are made in Great Britain, and not exceeding one-third in the United States and Canada. There is a little—very little—business of the latter class in German manufactures.

AMERICAN MACHINERY AND VEHICLES.

United States harvesting machines are sold largely and the smaller agricultural implements moderately, but American vehicles and wagons to only a small extent—the last named being by no means popular. Several American makers of vehicles and wagons have been represented here for some years; much time and money have been expended, but, as far as can be discovered, with indifferent success. The goods, especially the better class of carriages, give satisfaction to the users, but do not meet with popular favor. The main obstacle in the way is the conservatism of the country which will take many years' effort to overcome.

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*According to British official reports, the imports of agricultural machinery from the United States and Canada were as follows in 1902: From the United States, $1,308,207; from Canada, $212,216.

HOW TO INCREASE AMERICAN TRADE.

Speaking generally, American makers of all the lines mentioned are fully alive to the possibilities of this market and are exercising the best means possible to develop their business. Practically all the makers of harvesting machinery are well represented here, and it would be difficult to suggest any more effective means for increasing their trade than they now employ. Most of these firms have their own branch establishments. Makers of minor implements for the most part are represented by agencies, but the trade therein could be undoubtedly increased if British models were more generally followed.

DEALERS IN AGRICULTURAL IMPLEMENTS.

There are a very large number of established houses pushing United States goods here, and their names are well known to the trade.

DUTIES.

There is no tariff imposed on the importation of these articles into the United Kingdom.

H. CLAY EVANS,
Consul-General.

LONDON, ENGLAND, *July 23, 1903.*

IRELAND.

(From United States Consul Swiney, Cork, Ireland.)

Labor is higher in Cork than in any other county in Ireland.

Agricultural implements are used here to a greater extent every year.

American implements are popular and the trade therein is increasing. Spring-toothed harrows are coming into favor.

American vehicles are unknown here.

The best means for the enlargement of American trade is to get local houses, with good connections, to become agents therefor.

The following houses are engaged in the business: John Atkins & Co., St. Patrick's Quay; McKenzies (Limited), Camden Quay; and McBride & Sons, Merchants Quay, all of this city.

DANIEL SWINEY, *Consul.*

CORK, IRELAND, *April 29, 1903.*

SCOTLAND.

(From United States Consul Fleming, Edinburgh, Scotland.)

CHARACTERISTICS OF AGRICULTURE IN SCOTLAND.

Speaking broadly, all kinds of agricultural machines and implements suited to the requirements of the soils, crops, and climate are used by the farmers of Scotland. This does not apply, of course, to crofters and others having small plots of ground producing at best scarcely enough to pay rent and supply their modest wants, but to those who grow grain, hay, or root crops in commercial quantities for the market. With few exceptions, these implements are of modern pattern; in fact, fully up to date in design, quality, and utility. As the land, wherever arable—in the Lowlands or in the valleys and on the hillsides of the Highlands—has been cultivated for centuries either continuously in one way or another or at intervals of ten and twenty years, it is almost needless to say that successful farming nowadays involves not only annual fertilizing, but also careful and laborious preparation of the soil. This is true of the clay soils and loams and sandy soils in wet seasons, and especially of the clay in either humid or dry weather. The loams predominate in the productive tracts of Scotland, forming more than one-third of the cultivated land; the clays, rich and inferior, are somewhat less in extent than the loams; the sandy and gravelly soils are about one-half the area of the clays, and the acreage of mossy and alluvial lands is approximately two-thirds of that of the sandy and gravelly tracts. The loams are not easily worked, as a rule, if much rain falls in the autumn, making them heavy and giving rapid growth to weeds. In a favorable year—which too seldom comes—the ordinary clay soil breaks up well and is freer from weeds than the loam, but in wet seasons the clay is extremely difficult to deal with.

In these days of world-wide competition, not many Scotch farmers could succeed if they were not adepts in the arts of husbandry and if they did not have good implements, especially adapted to the local conditions.

FARM CULTIVATION AND HARVESTING.

On the average farm, where turnips, wheat, barley, oats, and hay are grown, the method of procedure, after manuring, is to break the land in dry or light weather with a plow that does the work somewhat in the fashion of the old Scotch "swing plow," making a furrow about 9 inches deep and putting it on edge—not throwing it over—for the reason that if on edge it will not harden so quickly and will be more easily worked by subsequent processes. The grubber is then applied, and afterward the harrow, a heavy implement with longer teeth than the harrow of the American farmer. Following this, a roller is used. Then the land, if clay or a soil of mixed clay and sand, is plowed again, harrowed, and probably also loosened with a cultivator or grubber, and in many cases the ground is plowed a third time. Turnips (grown for feed for cattle, sheep, and pigs) are sown with a drill, and when the sprouts are sufficiently high they are thinned out by hand labor, the female farm hands doing this work. It is said here that no mechanical device, other than the plain hoe, can aid materially this process of thinning turnips, as the plants, which are left from 12 to 15 inches apart, must be delicately dealt with. When the crop is ready to be gathered, the "shaws" or tops are removed and the turnips lifted by a 1-horse machine, automatic in its operation, which shaws and roots from 3 to 4 acres per day. The tops are scattered over the ground and occasionally a third of the turnips are left and sheep turned into the field to feed upon them. Later, much the same process as above described of preparing the soil is carried through and wheat sown. In the following August or September the grain is harvested. After another long period of preparation, including fertilizing, plowing, and grubbing, barley may be sown, usually in April. About a fortnight afterward grass seed is sown with the barley. The barley crop will be harvested in August or September following and the hay in July of the next year, and for the succeeding year the field is given over to pasture. This, briefly, is the common rotation—a grain crop succeeding a root crop, and every fifth year the land has a "rest."

The labor involved in preparing the soil is about the same year after year, whether the field was previously under cultivation or not; and in notably unfavorable seasons not a few farmers, Highland and Lowland, must plow their ground four times before it is ready for the seed. The work is much less in good weather on farms having a light soil, especially in Ayrshire and parts of the Lothians and of Fifeshire. One plowing may be sufficient, generally of a depth of 7 inches for grain and of 9 to 11 inches for potatoes. In the great potato-growing districts of the Lowlands—East and West Lothian, Ayrshire, and Fifeshire—the soil is mainly a rather light and sandy loam. Plowed in the autumn, it lies till spring under rain and frost. Then the fields are broken up with the cultivator or grubber, roller, and harrow. Planting is finished by the end of April, usually. The fields are further worked with the cultivator and ridged up; thereafter the hoe is used for weeds, etc. Large crops are produced—from 8 to 10 tons per acre in a good season, and on some farms in an exceptionally favorable year 14 tons per acre. In gathering the crops, potato diggers having rotary two-tined arms are commonly used in Fife, West Lothian, Ayrshire, and other parts; but in East Lothian a simple plow-shaped digger is employed, throwing the potatoes out on either side. No potatoes are dug by hand, except some of the early varieties in Ayrshire and Linlithgowshire, a comparatively small crop gathered in summer and sent at once to market; but large growers of these early potatoes lift the crop with the mechanical diggers.

As in preparing the soil and drilling or sowing the grain and grass crops, so in harvesting these crops the most improved and economical machines are required, not only because they are labor saving, but also because it is necessary to successful agriculture in this country, both to make the land produce as much as possible and to gather the crop clean, almost to the last straw or blade. Most farmers, in the Lowlands at least, grow great crops of wheat, barley, oats, and other grains; a yield of 60 bushels of wheat per acre is not uncommon and of barley from 50 to 60 bushels, while high cultivation brings as much as 80 bushels per acre of the latter. They must do it in order to make their holdings profitable, as the prices of grain are regulated by the American market and the rent of the land is generally high, and to the same end they must utilize fully the products of the soil. For this purpose they require every practicable mechanical aid.

FARM LABOR.

To what extent the cost of labor has influenced farmers to provide themselves with the best implements is a question to which it is not easy to find an answer. Undoubtedly the scarcity and unreliability of farm laborers have had something to do in this direction. It is a curious fact that in an overpopulated country—I speak of the United Kingdom as a whole—the demand for farm laborers is always greater than the supply. The conditions of country life in Scotland for the laborer are not as severe as they were some years ago—at least this is the testimony of students of social problems—and the pay of the farm worker (I refer to male and not female labor, the latter commanding from $2 to $2.50 a week, without board or allowances) is probably better than that of any other class of unskilled labor. Not that he receives more money than any worker in another unskilled occupation, but his wages in money and its equivalent are higher. The average wage of a farm hand is $5 per week, including his allowance of potatoes and rent of house; in addition, he has the use of a garden, which means much to him, as it materially reduces his living expenses. Yet there is more discontent among farm hands than in the various trades in the cities or among the urban day-laborers. As soon as they accumulate a little money they emigrate, many of them to become prosperous farmers in the United States or Canada.

I have talked with farm hands on this subject and have found that it is the hopelessness of the struggle in which they are engaged that makes them discontented. By no possible thrift or effort of their own can they ever acquire title to or possession of a foot of ground, and they are always looking forward to the day when they can go to the United States or a British colony and get an opportunity to work for themselves. The unstable character of farm labor is more noticeable in some parts of Scotland than in others, this class being relatively the smallest and the least dependable near the great manufacturing and mining centers, where they are tempted to give up farm work for other occupations in the vain hope of bettering their condition and prospects. I am informed that there are dairy farms in Lanarkshire of no more than 50 acres the proprietors of which devote part of the land to grain and have purchased the latest binders rather than depend upon hand labor for harvesting the crop. In one instance a dairy farmer who grows only 15 acres of wheat or barley bought a machine for this small annual crop of grain, explaining to the surprised dealer that he found that it would be economical for him to invest in a harvester. These are extreme cases due to special local causes, but they show that the unsettled state of farm labor has a bearing upon the trade in machinery, etc.

MARKET FOR IMPLEMENTS.

Scotland has an area of 19,062,482 acres, of which 4,894,466 acres are under cultivation; 112 persons own one-half of the total area, and 18 persons own one-fourth of it. It is quite apparent, therefore, that most of the farmers are occupiers under lease. The common terms of leases are fifteen and nineteen years. Special returns giving the number and size of agricultural holdings—*i. e.*, all holdings of leased land and of land owned by the occupiers—were last collected by the board of agriculture in 1895. At that time the number and acreage of such holdings of cultivated land, as distinct from mountain grazings, were as follows:

	Number of holdings.
1 to 5 acres	20, 150
5 to 20 acres	23, 104
20 to 50 acres	10, 817
50 to 100 acres	9, 834
100 to 300 acres	12, 968
300 to 500 acres	2, 070
500 to 1,000 acres	620
Over 1,000 acres	76

As compared with the returns collected in 1885, these statistics showed little change, and it is probable that if statistics were gatherable this year they would not differ materially from the above.

These figures furnish the best obtainable basis for an estimate of the possibilities of Scotland as a market for agricultural implements. So far as regards binders and mowers, the trade can not be considerable on very small holdings; it must be got from holdings above 50 acres, of which there are 25,568. My inquiries as to the use of machines, etc., on farms have been restricted to farms above 50 acres, for at the outset I discovered that no dealer or other person in a position to know agricultural conditions would venture an opinion concerning the market offered by the small holdings—from 20 to 50 acres—for any class of labor-saving devices. It is believed that not far from 85 per cent of farmers having 50 or more acres use up-to-date implements for nearly all farm purposes. Some dealers limit this estimate of 85 per cent to holdings of 100 acres or more, but the weight of opinion seems to include holdings of from 50 to 100 acres.

AMERICAN FARM IMPLEMENTS.

American farm implements have been in use in Scotland for twenty-five or thirty years—not all classes, but the principal ones. Some of our manufacturers, when they were ready for the foreign trade, studied the requirements of the British market and adapted their contrivances to conditions in this country. In a report on this subject in 1898 (printed in CONSULAR REPORTS No. 220, January, 1899), I said, among other things:

> When the binder was invented it commended itself at once as a labor-saving device, but it encountered difficulties in Scotch fields. There is here a heavier stand of grain than in most parts of the United States. Moreover, the farmers sow grass seed with the barley. This grass is exceedingly fine and also dense. The new reaper was a failure at first, owing chiefly to the fact that the undergrowth of grass in the barley interfered with its working. The blade of the machine was too light, and the canvases were not properly adjusted. No sooner were these defects—from a Scotch point of view—ascertained than a heavier blade was introduced and the canvases were altered. In less than two years the American binder was an established favorite; it still holds the market. The chilled plow was not at first suited to the needs of Scotch farmers. They prefer a narrow furrow and do not deem it a good plan to turn the furrow over; they wish, rather, to set it on edge. The plow was changed to meet their ideas as to the proper way to turn up the ground, and the result was that the American plow has gained almost universal favor. American farm machinery of almost every description has had to be altered in some important respects to adapt it to the different conditions found here. Most manufacturers have been quick to make the necessary changes, and their enterprise has been abundantly rewarded.

It is my information, derived from interviews with the managers of the most prominent local firms in the trade, that at the present time 70 per cent of the binders, 75 per cent of the mowers, 25 per cent of the hayrakes, from 60 to 70 per cent of the plows, and about 70 per cent of the cultivators and grain drills in use in Scotland were manufactured in the United States. It is said that 20 per cent of the binders are Canadian and 10 per cent English. The estimate here given of the proportion of American plows is confined to farms of upwards of 100 acres. On smaller holdings, many of the plows are of local manufacture; they are made in the shops of village blacksmiths, as well as by implement manufacturers in the cities and larger towns. Our chilled plows are, however, constantly growing in favor and the market for them is an expanding one. Only walking plows are in demand, with one wheel to the beam as a rule. The gang plow is so seldom wanted that it can hardly become a commercial item of great importance in this country. The steam plows and cultivators used on a few big farms are, it is said, all made in England, as well as the engines, cables, etc. In plow parts the American manufacturers have practically all the trade. This is true also of hayforks. Hoes are largely English, made to American patterns; our makers do not compete in prices, although the handles are imported from America by the Sheffield manufacturers. Our hay knives have a good sale; also our snaths and handles in general. Few American harrows are sold here, as the makers have not, I am told, adapted them to the deep cultivation required; nor are many of our rollers imported. Our thrashing machines are not used, being regarded as too light to throw off the extraordinary weight of straw and grass in Scotch grains.

According to one Edinburgh dealer, farmers are now finding fault with some patterns of American cultivators, claiming that they do not go deep enough; but, so far as I can ascertain from other sources, the tendency of trade does not show that they have fallen out of favor. The grubber is an important implement in Scotland for tearing up the ground to any depth required. They are used on every farm and are, I believe, all of local manufacture. Potato diggers are of Scotch and English make. It is said by growers that the rotary-arm digger commonly used damages the potatoes, especially the early and tender varieties; they are more satisfactory than the potato plow, but the growers are looking out for something better. Any suitable device that will not bruise the potatoes will, if offered at a moderate price, find a good market here. Windmills for pumping water for stock, etc., are not as common in Scotland as in England. Streams are numerous and, with an abundant rainfall throughout the year (often superabundant), provide an ample supply of water for general purposes on the majority of farms. I am told that most of the windmills as well as the hand pumps in use are of American manufacture; this may be too large a statement, but it is not far wrong. Our standard pumping devices have an excellent reputation and a wide sale.

PRICES.

Prices quoted by leading dealers to the farmers for various implements may not be without interest to some of our manufacturers. Discounts can not be given, as the firms say no more than that "liberal discounts" are allowed for cash payment. The prices are as follows:

Plows.—General-purpose plow, with moldboards, either steel or chilled metal, single wheel, lea and stubble mounting, two shares and two coulters, $20; patent chilled plow, with one wheel and skim coulter, $20; with two wheels and skim coulter, $21.25; double mold or drill (for making ridges or drills), fitted with regulating screws for expanding moldboards to various widths, from $18 to $22; potato plow with two wheels and a pair of raisers, $20.

Harrows.—Spring-tooth harrow, tines fitted with reversible hard-tempered steel points, $27; general-purpose seed harrow, to cover space of 8 feet, from $14.20 to $16.80; to cover 9 feet, from $16 to $18.20; single-brake harrow, $18; self-relieving chain harrow, specially adapted for separating the weeds from the clods, from $15 to $21.50, according to size.

Grubbers.—Two-horse grubber, with three wheels and spring lever for regulating the depth of teeth, $37.

Turnip sowers and toppers.—Two-row turnip sower, $31; turnip topper and lifter, $42.

Cultivators.—Combined steel cultivator and grubber for root crops, $56.

Seed-sowing machines.—Broadcast grain and grass-seed sowing machine, drawn by 1 horse and sowing a breadth of 18 feet, $79.

Grain drills.—Light-draft grain drill, 11 rows, 6 inches between rows, $115.

Potato planters.—Potato planter, 1-horse, planting from 7 to 8 acres per day, $70.

Rollers.—Land roller, from $30 to $60; drill roller, $25.

Binders.—Binder, fitted with ball and roller bearings, two knives, $205.

Mowers.—Mower, 2-horse, with two knives, $80; combined mower and reaper, with two knives, $93.

Rakes.—Hayrakes, 8 feet 6 inches, 26 steel teeth, steel wheels, $41.20.

Diggers.—Potato digger, $60.

The following are the prices quoted by wholesale dealers for the season of 1903, quantities of less than a half dozen charged extra:

Scythes.—Scythes, various patterns, sizes from 30 to 48 inches, from $6.20 to $9.35 per dozen; scythe snaths, good ash, $3.55 per dozen; selected ash, $4 per dozen.

Hayrakes.—Hayrakes, iron bow, 14 teeth, pine handles, $1.85 per dozen; ash handles, $2.10 per dozen; steel hayrakes, heads only, $3.80 per dozen; American pattern snaths, $3.65 per dozen.

Hay knives.—Hay knives, 18 to 20 inches, from 60 to 65 cents each.

DEALERS IN AGRICULTURAL IMPLEMENTS.

I give herewith the names of 46 firms in various parts of Scotland engaged in the agricultural-implement trade, as dealers or agents and in some instances also as manufacturers:

Aberdeen.—Cardno & Darling, Corn Exchange Building; Harper & Co., Hadden street; William Hardy, 8 South Constitution street; T. McKenzie, 33 Summer street; Benjamin Reid & Co., Justice Mill lane; Reid & Leys, 8 Hadden street; James Nicol, 33 Catherine street.

Aberdour.—John McDonald.

Berwick-on-Tweed.—George Black, Main street, Tweedmouth.

Paisley.—A. M. Pottie, St. James place.

Blairgowrie.—J. Bissett & Sons (Limited), Perth road; James S. Fraser & Son, Rattray.

Bonnybridge.—David Gillies & Sons.

Campbeltown.—William Reid, 34 Long row.

Castle Douglas.—James Gordon, King street; Alexander Watt, St. Andrew street.

Cumnock.—John Drummond & Son; George M'Cartney & Co.

Cupar-Fife.—Hood & Robertson, 31 Crossgate.

Dumfries.—Charlton & Wyllie, 32 South street; Thomas Turnbull, Castle Bank.

Dunfermline.—Flear & Thomson, Station road.

Edinburgh.—A. & J. Main & Co. (Limited), 39 Grassmarket; T. Gibson & Son, Gibson terrace; A. M. Russell, 29 Grassmarket; Carrick & Ritchie, Norton park; Thomas Scott & Co., 51 Grassmarket.

Glasgow.—P. & R. Fleming & Co., 29 Argyle street; McCormick & Campbell, 172 Stobcross street; J. Wallace & Sons, 28 Graham square; J. P. Cathcart, 136 Buchanan street.

Ellon.—Alexander Pirie.

Forfar.—James Mackintosh.

Forres.—Donald Munro & Son.

Girvan.—James Crosbie, 40 Dalrymple street.

Keith.—Auchinachie & Simpson.

Kilwinning.—J. & P. Wilson.

Lasswade.—John Anderson, Polton street, Bonnyrigg.

Linlithgow.—Armour Brothers.

Hopetoun.—Alexander Newlands & Son, Provost road.

Mauchline.—Andrew Pollock.

Peterhead.—James Simpson & Son, Prince street.

Rothes.—Andrew Grant.

Stirling.—Robert Miller & Son, 2 George street.

Uddingston.—Archibald Forrest.

Wick.—Alexander Robertson & Son, Bridge street.

BUILDING UP AMERICAN TRADE.

During the last decade the competition among manufacturers of agricultural implements for the trade in this part of the United Kingdom has been active, especially so during the past five years. The principal American makers of harvesting machines, etc., have pushed their business vigorously in rivalry with one another and with Canadian and British companies. They sent expert salesmen to assist their local agents in reaching out for trade, these salesmen making a farm-to-farm canvass of the country. The figures above given show that the sales have been large, and as a binder or mower in the hands of a careful Scotch farmer lasts a long time, there is now a slackness in the trade. The demand is moderate, with a downward tendency in prices. Canadian firms are exceedingly persistent and energetic. They are a factor in the problem of trade in these islands in the future which American manufacturers will have to reckon with. While our agricultural apparatus of all kinds are, as a rule, superior to the Canadian, and have gained a leading position for that reason, cheapness is likely to be, in most cases where competing articles are offered, the determining quantity in the commercial equation, and therefore it is only by continuing to meet the prices of all competitors that our manufacturers can maintain their supremacy in this market.

FARM VEHICLES.

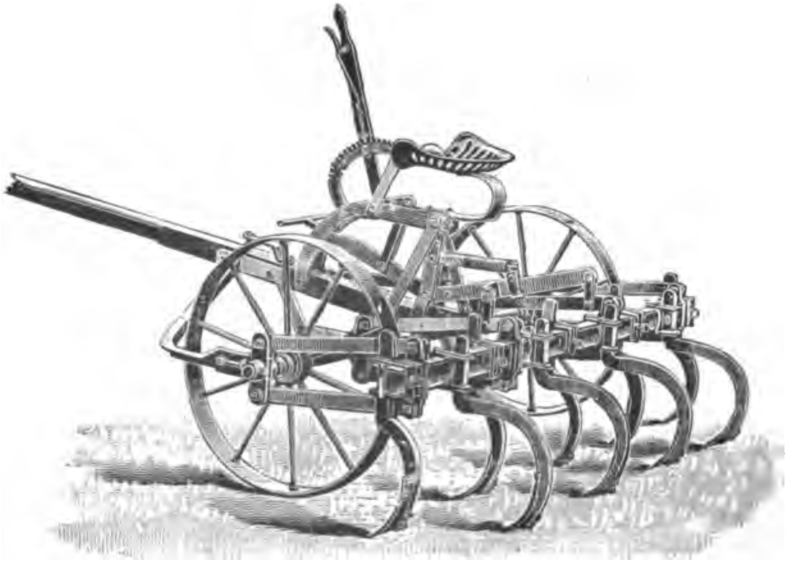
American farm wagons or carts are not sold here in any considerable number. A lorry, or wagon, is seldom seen on a farm north of the Tweed. The Clydesdale horse shuts the wagon maker out of the Scotch market. These powerful animals, drawing big carts, are apparently able to do all the hauling required; at least they seem to satisfy the farmers for every purpose at all seasons. The carts are mainly of local manufacture, being made in almost every city and village. Requiring no skillful workmanship, they are constructed cheaply, with a sole view to utility. My information is that the only reason why carts of American make are not used in Scotland is that a similar article has not been offered at the same price. A prominent dealer in farm machinery, supplies, etc., tells me that when in America a few years ago he asked the manager of a great wagon-making concern if they could manufacture farm carts for Scotland at a price which would give them a market in competition with the local makers. The manager expressed the opinion that it could be done. On returning home this dealer sent to the American company a Scotch cart and also a lorry (used for hauling goods to and from railway freight depots), giving prices, etc. Not long afterward a letter came from the manager saying that he had figured as closely as possible on the cart and lorry proposition and could not work out a margin of profit after adding freight. The freight charge put it just above the level of the practicable.

HOW TO INCREASE AMERICAN TRADE.

In regard to the most effective means of increasing the sale of implements and other farm supplies, I can only suggest that the best results are likely to be obtained by the efforts of experienced American salesman, actively cooperating with local agents in pushing trade. One good method of bringing articles to the attention of the farming community has been neglected on too many occasions by our manufacturers or their representatives on this side; I refer to exhibits at agricultural shows. These shows, general and local, are frequent in Scotland during the year and are attended by the alert, progressive farmers. Any machine, implement, or vehicle exhibited in an attractive way is well advertised, and if it has exceptional merits it will not be overlooked. A number of American concerns have taken advantage of the larger shows and now and then a minor exhibition; but if any firm or any association of implement manufacturers would make a thorough commercial campaign in this country, they should lose none of these opportunities to reach the enterprising class of agriculturists. As an agent remarked to me, half a dozen implements sold to prominent farmers at such places will sell hundreds more. That has been his observation, and he is a strong advocate of exhibits at county shows and on even less important occasions.

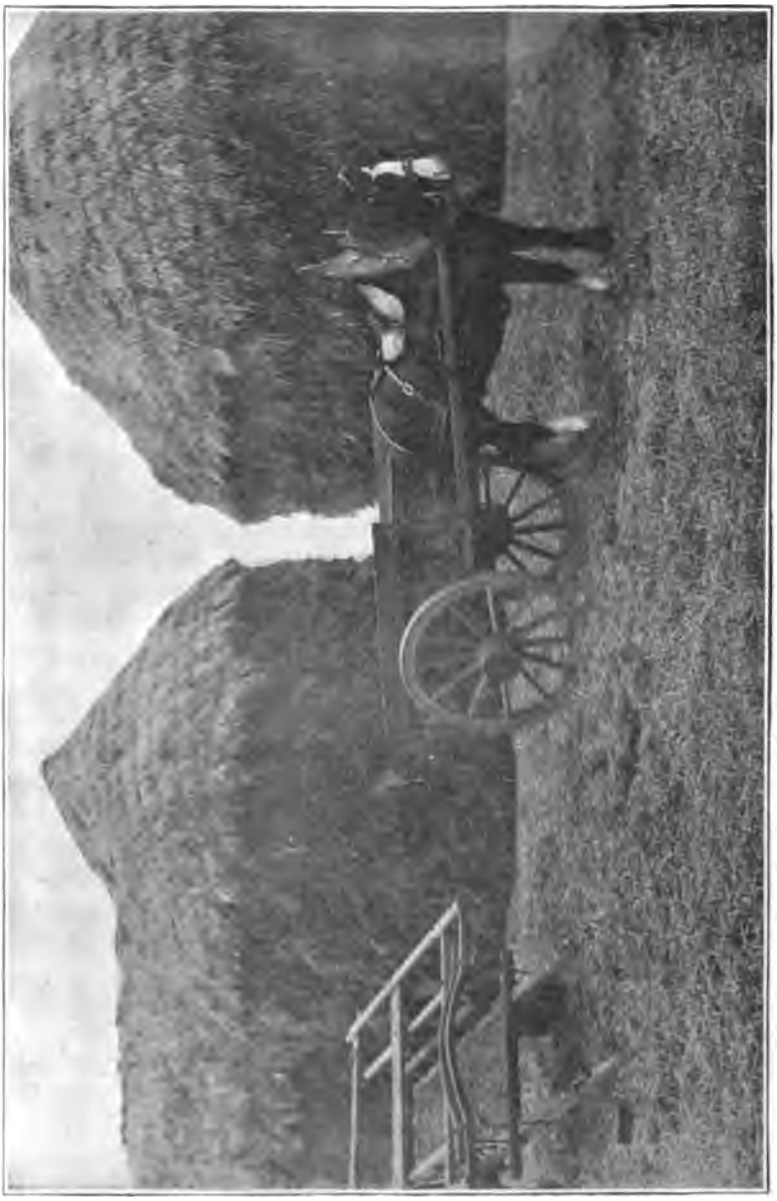
RUFUS FLEMING, *Consul.*

EDINBURGH, SCOTLAND, *June 18, 1903.*



Combined cultivator and grubber.

Heavy grain crops on a Midlothian farm.



The Scotch cart.

AMERICA.

NORTH AMERICA.

DOMINION OF CANADA.

BRITISH COLUMBIA.

(*From United States Consul Dudley, Vancouver, British Columbia.*)

ROADS AND DRAFT ANIMALS.

The roads and draft animals of British Columbia are suitable for the use and styles of American vehicles.

HOW TO INCREASE AMERICAN TRADE.

Agriculture has not yet become one of the largest industries of British Columbia, but the amount of land cultivated is increasing each year, and the demand for agricultural implements is constantly growing larger. I believe that an agency established here for such implements and articles as are named in the list furnished by the National Agricultural and Vehicle Manufacturers' Association could open a very fair market in this Province. I should recommend that the association establish an agency in this city, with one or more traveling agents to canvass the interior points, and, if possible, I think the agency should be supplied with samples of the more important articles offered for sale.

I think that a trade in the following-mentioned articles can be worked up here by an active agent: Autos, agricultural implements, buggies, brass goods, leather belting, carriages, cordage, farm trucks, woven-wire fencing, gasoline engines and pumps, farm implements, road machines, elevator machinery, brick machines, power-transmitting machinery, mining machinery, plumbing supplies, rock crushers, rollers, road graders, shovels, spades and scoops, and farm, road, and mountain wagons.

DEALERS IN AGRICULTURAL IMPLEMENTS.

The leading houses engaged in selling such articles as are mentioned in the list of the national association are E. G. Prior & Co., Wood, Vallance & Co., and McLennan, McFeely & Co., all in Vancouver.

If the association should decide to establish an agency here it will give me great pleasure to give the agent every assistance in the power of this office.

L. EDWIN DUDLEY, *Consul.*

VANCOUVER, BRITISH COLUMBIA, *July 23, 1903.*

NEW BRUNSWICK.

(From United States Consul Denison, Woodstock, New Brunswick.)

HAND LABOR VS. MACHINERY.

Practically all kinds of labor-saving agricultural implements are used in this district, the cost of hand labor being about the same as in the neighboring part of the State of Maine.

ROADS, ANIMALS, AND VEHICLES.

The road and draft animals are admirably suited to the use of American styles of vehicles.

IMPLEMENTS IN USE.

Modern agricultural implements are very generally used in New Brunswick, and Canadian (Ontario) manufactures fill a large place in the market. McCormick and Deering harvesting machinery are also largely used. Dominion manufacturers have a number of warehouses throughout this district, with agents who work for trade. The Canadian tariff helps them in their competition with foreign-made goods.

HOW TO INCREASE AMERICAN TRADE.

In my opinion there are fewer American-made implements sold here than was the case, say, five years ago, although there are still a good many. They are popular and trade would increase if the prices were low enough to compete, in spite of the fact that a considerable part of the buyers would favor goods of Canadian make.

COUNTERFEITING AMERICAN IMPLEMENTS.

Again, many implements are made here which are practically facsimiles of American manufactures, notably horsepower sawing and thrashing machines, plows, and foundry ware.

DEALERS.

Messrs. W. F. Dibbler & Son, Balmain Brothers, and Wm. McDonald, of Woodstock, New Brunswick, and A. R. Hallett, of Grand Falls, New Brunswick, are dealers in agricultural implements.

FRANK C. DENISON, *Consul.*

WOODSTOCK, NEW BRUNSWICK, *June 23, 1903.*

NEWFOUNDLAND.

(*From United States Consul Cornelius, St. John's, Newfoundland.*)

CONDITIONS UNFAVORABLE TO AGRICULTURE.

Newfoundland, according to the census of 1901, has a population of 220,984. The main industry is fishing. The seacoast along which most of the people are settled is the most sterile and unproductive portion of the island. This confines the cultivation to the more limited class of vegetables and fodder—potatoes, turnips, cabbage, hay, and oats.

The interior of the island contains many arable tracts, the settlement and development of which is now proceeding. Within the past four years the government has taken up the problem of encouraging agriculture and has appropriated $250,000 as bonuses for the clearing of land. At the last session of the legislature, agricultural implements and machinery and pedigree live stock were placed upon the free list, and the holding of an agricultural exhibit is now being arranged for. Hitherto, the great drawback to the expansion of the farming interest has been the lack of industrial centers to absorb the products of the farms. St. John's, the capital, with a population of 35,000, is the only community in the island that has afforded a market for any substantial quantity of the harvest of the soil and therefore the largest agrarian section in the island is that immediately surrounding St. John's. Elsewhere the produce from the farm is for domestic consumption alone. Of late the progress of the mining and lumbering industries has remedied this to some extent, creating a demand for farm stuffs, which is being met by the agricultural settlements that are being located in as close proximity to them as possible. Even in the most remote and isolated fishing hamlets the people are attempting to grow potatoes and root crops, while sheep and cattle raising promises to be largely engaged in. An act has been passed by which settlements can, through a local-option process, decide to have all the dogs within their locality or township area destroyed, so that the raising of sheep may not be jeopardized by their presence.

AMERICAN IMPLEMENTS IN USE.

Implements of manual husbandry, such as scythes, sickles, hand-rakes, pitchforks, pickaxes, shovels, etc., are naturally most used, the majority of farms being small, but there is a gradual increase in mowers, spreaders, and rakes operated by horse power and used in harvesting the hay crops, and these are imported almost exclusively from the United States. Plows and vegetable cutters are also in considerable demand, and wire fencing is being used extensively. These articles, too, are mostly of American manufacture. The adverse climatic conditions impose such limitations upon the character and variety of the crops grown that extensive farming on the lines common to the American continent is not to be looked for in the near future until scientific research is employed in the interest of the industry. So far that has not been done, and the people have made less advance, perhaps, than if they had been given more encouragement. There is some advocacy of the establishment of an experimental farm, than which no more desirable step could be taken.

HAND LABOR VS. MACHINERY.

The cost of hand labor is not sufficiently great to justify the use of machinery in farming pursuits, save to the limited extent above indicated, because in most cases a man and his family are sufficient to harvest such crops as they may need.

AMERICAN IMPLEMENTS.

The trade in agricultural implements is steadily improving, and about three-fourths of the articles imported are from the United States. American implements are in favor and the demand for them is greater than for any others. The total value of the imports of agricultural equipments for the calendar year 1902 was nearly one-third greater than for the previous year, and almost the entire increase occurred in the imports from the United States. Mowers, spreaders, and rakes, operated by horse power are almost exclusively of American manufacture. The same may be said of vegetable cutters and wire fencing.

ROADS, ANIMALS, AND VEHICLES.

The road and draft animals are not suited for the use of American styles of vehicles. In the majority of the small settlements horses are rarely used, and the vehicles for the larger sections are all of local build, though the stock used in them and all the fittings and accessories are imported mainly from the United States.

HOW TO INCREASE AMERICAN TRADE.

The trade in agricultural implements can be increased by a more energetic advertising of the goods and traveling salesmen visiting the larger centers. The pushing of trade in these items has been much neglected by American manufacturers.

DUTIES.

Agricultural implements and machines are now free of duty in Newfoundland, but a tariff of from 15 to 30 per cent is imposed on the materials used in construction of vehicles, with heavier rates on vehicles themselves.

DEALERS.

The houses most likely to be interested in promoting this business are the following, all of St. John's:

E. F. Carter, New Gower street.
Martin Hardware Company.
George Knowling.
Ayre & Sons (Limited).
Sydney Woods.
Parker & Co.
Bowring Brothers (Limited).
Bishop & Monroe.

GEORGE O. CORNELIUS, *Consul.*

ST. JOHN'S, NEWFOUNDLAND, *August 18, 1903.*

NOVA SCOTIA.

(*From United States Consul-General Foster, Halifax, Nova Scotia.*)

HAND LABOR VS. MACHINERY.

The cost of hand labor is sufficiently high to justify and necessitate the use of labor-saving machinery by the agricultural and manufacturing interests of the maritime Provinces of Canada.

ROADS, ANIMALS, AND VEHICLES.

The roads and draft animals are suitable for the use of most American styles of vehicles for pleasure and freight, but for automobiles and other high-speed vehicles the roads in this part of Nova Scotia are rather too rough and stony.

AGRICULTURAL IMPLEMENTS IN USE.

Modern agricultural implements are very generally used in preparing the soil, sowing and planting the seed, cultivating during growth, and in harvesting and gathering the crops. A large and increasing proportion of the agricultural implements used in Nova Scotia are manufactured in Canada, though many of the harvesters, some manure spreaders and farm wagons, and a good many small hand tools are imported from the United States.

AMERICAN AGRICULTURAL IMPLEMENTS.

American agricultural implements, vehicles, and wagons are still sold in this Province and are popular in every way save price. Indeed, it is the aim of Canadian manufacturers to imitate American machines in style and finish. It will be difficult, however, to materially increase the trade in such articles (1) because practically the entire present importation is from the United States and (2) because of the Canadian customs tariff. The tendency here is to manufacture more and more within the limits of the Dominion both by Canadian concerns and by branch factories of American producers. In some instances Canadian manufacturers bind their customers to handle only Canadian goods or make annual rebates conditioned upon their customers agreeing not to handle any competing lines of goods.

Railway locomotives have been obtained almost exclusively in the United States, but during the past year contracts have been made with manufacturers in Scotland for a considerable number to be used upon Canadian railways. It is stated that the reason for this has been the difficulty in obtaining early deliveries from American manufacturers.

HOW TO INCREASE AMERICAN TRADE.

The most effective means of introducing or increasing the trade in agricultural implements would be to employ resident agents.

DEALERS IN AGRICULTURAL IMPLEMENTS.

Leading houses engaged in hardware or other lines of trade are not generally inclined to undertake the handling of agricultural implements or large machines, but many of the hardware dealers carry scythes and other small tools.

DOMINION IMPORTS AND DUTIES.

The imports of agricultural machines and implements, vehicles, locomotives, etc., into the Dominion of Canada during the nine months ended March 31, 1903, and the duties collected thereon, were as follows:

Description.	Duty.	Imported from the United States.	Total imports.
Agricultural machines and implements:	*Per ct.*		
Cultivators and weeders	20	$10,625	$10,625
Drills	20	48,765	48,765
Farm, road, or field rollers	25	608	608
Forks, pronged	25	4,897	4,958
Harrows	20	31,110	31,110
Harvesters, self-binding	20	718,113	718,113
Hay tedders	25	6,298	6,298
Hoes	25	598	813
Horserakes	20	123,995	123,995
Hay and straw knives	25	128	128
Lawn mowers	35	1,946	1,946
Manure spreaders	20	6,428	6,428
Mowing machines	20	296,619	296,619
Plows	20	212,528	212,580
Post-hole diggers	25	200	200
Potato diggers	25	1,168	1,168
Rakes, n. e. s	25	766	766
Reapers	20	17,770	17,863
Scythes	25	5,834	6,264
Sickles or reaping hooks	25	12	12

Description.	Duty.	Imported from the United States.	Total imports.
Agricultural machines and implements—Continued.	*Per ct.*		
Spades and shovels and iron or steel cut to shape for same	35	$13,051	$24,515
Parts of agricultural implements	20	367,015	367,097
All other agricultural implements, n. e. s	25	37,634	40,020
Total		1,906,108	1,920,891
Vehicles, etc.:			
Springs, axles, axle bars, and axle blanks and parts thereof	35	25,448	72,280
Carriages, buggies, pleasure carts, etc	25	32,074	35,443
Farm wagons	25	111,921	111,921
Freight wagons (drays)	25	11,457	11,508
Railway passenger cars	30	20,329	20,329
Box and flat cars	30	45,251	45,251
Parts of railway cars	30	248,110	300,911
Railway locomotives	35	1,044,538	1,044,538
Binder twine	Free.	235,385	338,260
Fencing wire—			
Barbed	Free.	376,991	407,531
Woven, etc	15	5,073	7,223
Horsepowers	25	6,042	6,042
Portable engines	25	428,756	428,756
Portable separators and thrashers	25	267,736	267,736
Sewing machines and parts	30	237,101	240,223
Hardware (builders), etc	30	494,859	538,477
Pumps, iron	25	158,112	158,414
Harness and saddlery	30	46,706	53,819
Total		3,795,889	4,088,662
Grand total		5,701,997	6,009,553

JOHN G. FOSTER,
Consul-General.

HALIFAX, NOVA SCOTIA, *June 20, 1903.*

MANITOBA.

(*From United States Consul Graham, Winnipeg, Manitoba.*)

HAND LABOR VS. MACHINERY.

Labor-saving machinery is in general use by the agricultural and manufacturing interests of Manitoba. The best of modern machinery is in demand and all conditions are favorable to its profitable use.

AMERICAN IMPLEMENTS.

Many lines of American-made implements and machines are largely used. Perhaps one-half of the farm wagons here are of American manufacture and a still larger proportion of the plows, harvesting and thrashing machinery, and heavy machinery in general is American made. The lighter machinery, carriages, cutters, sewing machines, bicycles, etc., in use are largely of Canadian manufacture, produced principally in eastern Ontario.

HOW TO INCREASE AMERICAN TRADE.

American-made machines and implements are popular in this country and the more general use of them is simply a question of cost. If they can be put on the markets here at prices that will compete with prices of Canadian-made goods, the demand for them will largely increase.

DEALERS.

The Fairchild Company, H. T. Anderson, Canadian Molino Plow Company, Frost & Wood Rock Island Plow Company, Massy Harris Company, Joseph Maw Company, Western Implement Company, Bridge & Cooper, and the Hudsons Bay Company, all of Winnipeg, are large dealers in imported and domestic machinery, implements, etc.

W. H. H. GRAHAM, *Consul.*

WINNIPEG, MANITOBA, *June 13, 1903.*

MEXICO.

(From United States Vice and Deputy Consul-General Conley, Mexico City, Mexico.)

HAND LABOR VS. MACHINERY.

About 20 per cent of the agricultural implements and tools used in Mexico are modern; the other 80 per cent are of the crudest and most primitive type. Only the large farmers, or haciendados, employ modern agricultural implements, and those only within comparatively recent years. Labor in Mexico is very cheap. Farm laborers may be employed at from 18 to 50 cents in United States currency per day, though in many parts of Mexico they are very scarce and unreliable.

AMERICAN IMPLEMENTS.

About 95 per cent of all modern agricultural implements and tools used in Mexico are imported from the United States, the remainder being imported from Germany. The implements most in use are reapers, thrashers, mowers, and iron plows, the latter principally with single handle and wooden frame—all being usually of the cheapest construction.

HOW TO INCREASE AMERICAN TRADE.

American manufacturers and their agents in Mexico have created the market here for agricultural implements and hold a practical monopoly on it. It does not follow, however, that they will hold this monopoly if they do not follow up their advantage. If they had not secured the field, European manufacturers would have been more strongly represented here and would have secured more trade, Any failure on the part of the American manufacturers to maintain the high standard they have set and to watch the field carefully will open a gap for the European wedge. It is not probable that agricultural implements will be manufactured in Mexico for many years yet, leaving little to fear from that quarter.

An increase in the trade in American agricultural implements in Mexico means simply an extension of the field. That more trade can be created there is no doubt. Experience has shown that complicated agricultural machinery or even simple agricultural implements that are costly are impractical in Mexico. In the case of complicated machinery it has been shown that Mexican laborers, unaccustomed thereto, are unable to operate it successfully and economically. To bring in American skilled laborers to operate it increases the cost to a point that makes results more expensive than those obtained by the use of hand labor. Further, most of the agricultural machinery sold in Mexico is sold by agents; no stocks are kept even in the larger cities, nor are parts kept on hand in sufficient quantities. Railway communication has not yet been established in all parts of the country. Breakage is more common than in the United States on account of the laborers being unused to the operation of machinery. If a machine, such as a reaper, mower, thrasher, or traction engine, breaks it means several weeks or months to place it in order, since the parts usually have to be supplied from the United States. That means a loss to the owner, a temporary reversion to primitive methods, which is likely to be permanent, and discourages other farmers from buying such machinery or any other modern agricultural implements. In the case of simple but expensive implements the loss by breakage is the deterring factor in increasing the trade. The laborer, accustomed for centuries to a wooden plow, is more likely than not to break a steel plow with very little use. To begin with, he is prejudiced against modern labor-saving machinery (it means less work for him as a class and more work for him as an individual); second, he is unaccustomed to it and his ignorance causes waste and breakage; third, neither he nor his employer are used to caring for such machinery or implements, and they allow them to rust or deteriorate from lack of care; fourth, in the low, moist regions rust is an enemy to metal implements, even when they receive good care. Therefore, the primary requisite for agricultural machinery or implements for the Mexican trade is simplicity and inexpensiveness.

American manufacturers should spend money freely to create a trade in agricultural implements, and should be willing to lose for a time, while laying the foundation, with the certainty of future profit. Competent representatives should be employed in Mexico—

persons who speak Spanish perfectly and are used to the customs of the people and who know how to deal with them. It is difficult for Americans to understand that business in Mexico is conducted largely upon a personal basis. An order for a thrasher from a wealthy Mexican farmer depends as much upon the salesman's personality as upon the merits of the machine. Rushing, bustling, strictly business methods are not successful in Mexico outside of the larger cities, and not to any great extent even in them. The gesticulating, rapid-fire-phonograph sort of salesman is worse than useless in Mexico; he not only fails to secure business for himself, but he makes it almost impossible for the next salesman to get the attention of possible customers. The first step for an American manufacturer to take, who desires to build up a business in Mexico, is to employ salesmen possessing the above-mentioned qualifications, and in addition possessing good "fronts"—that is, well-dressed, prosperous-looking, polite, and pleasing gentlemen. To secure such salesmen no expense of salary should be spared. Mexico is no place to send low-salaried salesmen. The salesman must be first of all a gentleman; afterward a good business man. The salesman of agricultural machinery and implements must operate with a catalogue, since it is impracticable for him to carry samples; give him a handsomely gotten up catalogue in Spanish and then give him plenty of time. Starting into a new district he must become acquainted with his prospective customers before he can talk business to them, and that takes time; but after he once sells a lot of machinery to one farmer the rest is easy if it gives satisfaction. The spirit of emulation among the wealthy famers, and among the wealthy members of all classes in Mexico for that matter, is strong. If one farmer buys a handsome thrasher his neighbor must also have one—a little bit better, if possible. Here a word to the American manufacturer While making your article good, put plenty of paint and finish on it.

Next to the matter of salesmen in line of importance comes that of advertising Mexico is practically a virgin field in the matter of advertising, and the American exporter who pays adequate attention to it is the one who will win the lion's share of business. American advertisers have already been advised repeatedly by this office to send catalogues to Mexico printed in Spanish. Exporters who wish to distribute advertising matter by mail will find the most complete list of names in a general directory of this city and of the Republic, published by Ruhl & Alschier, Calle del Espiritu Santo, No. 1½, this city (Mexico), at $10 Mexican. Newspaper advertising in Mexico in the Spanish press is controlled by B. & G. Goetschel, advertising agents, Primera Independencia 3, this city (Mexico). A liberal use of printers' ink in legitimate publications is to be recommended strongly. Other forms of display advertising can be used profitably. Mexicans, particularly those in the agricultural districts, are not accustomed to costly and lavish advertising, and it is fair to suppose that judicious signs and other advertising ideas would attract their attention. But probably the best form of advertising would be a display of goods. Every city, town, and village in Mexico has its annual fair, not like the county fairs in the United States, but several days given to pleasure, usually in celebration of some religious event, when it puts on its holiday attire and all the people for miles around congregate for business and pleasure. An association of agricultural-implement manufacturers would do well to send an elaborate line of its products to Mexico, to be in charge of representatives possessing the requisites above given for salesmen, to go from place to place at their fair times, exhibiting, explaining, distributing literature and other advertising matter, making friends, and paving the way for salesmen to come later. Mexican agriculturists must be educated to the use of modern agricultural implements by demonstration. If a man has never seen a thrasher it is hard to sell him one from a catalogue.

The disadvantage, above referred to, of the loss of time in case of breakage occassioned by the necessity of sending to the United States for broken parts should be remedied. Large stocks of agricultural machinery, implements, and parts should be carried in all of the larger cities. They would serve a double purpose—straight business and advertising. From the advertising standpoint they would serve the purpose of permanent expositions. The class that is able to buy modern implements and machinery visits the larger cities occasionally and it can be interested in a display of machinery and implements with a good salesman behind it far more quickly than in a catalogue. Further, the ability to supply a broken implement or part or to send an expert to repair a machine at short notice would overcome a great objection to the use of such implements and machines which now exists. An instance may be cited to show that this is not mere theory. The largest mining-machinery house in the Republic was started a few years ago in competition with the old established houses that had had a monopoly on the trade for years. It was started as a branch of an American house. Americans, who possessed the requisites above described, were placed in charge. They were given a large and well-selected stock—not a few samples and catalogues—and were prepared to fill orders of the ordinary sort in a tenth of the time required by their competitors. In the space of a little over three years the house has built up a trade as large, probably, as that of all the other houses combined and has secured a practical monopoly on mining machinery in Mexico for American manufacturers.

Another important point is the adaptation of agricultural implements and machinery to the special needs and requirements of Mexico. Before starting upon any systematic campaign to enlarge the field of operations in this Republic, American manufacturers should send experts here to study the needs of the Mexican farmers. Some products are raised in Mexico that are not raised in the United States, requiring special implements and machinery for its cultivation and harvesting. Besides this there are differences in soil, climatic conditions, and labor to be considered. The manufacture of special implements and machinery for the Mexican trade would probably not pay at first, but it should pay in the course of time.

Some complaint has been heard among local dealers and agents of delay on the part of American manufacturers in filling orders. This should not occur. The great advantage of American manufacturers in securing Mexican trade, aside from the superiority of their products, is their proximity to Mexico and consequent ability to fill orders in far less time than European manufacturers. In building up a growing trade, nothing should be left undone to please our foreign customers. Small details, such as care in packing, attention to customs requirements, prompt dispatch of goods, etc., have been frequently brought to the attention of American manufacturers by this office, but insistence upon their observance can not be too frequently repeated.

DUTIES.

The import duty into Mexico on agricultural implements is 1 cent Mexican per gross kilogram (2.2046 pounds), minimum rate. All import duties of Mexico are at present on a sliding scale based upon the rate of exchange—that is, the fixed rate of duties is charged when an American dollar is worth $2.20 or less in Mexican currency; when it is worth more, the corresponding premium on gold, or American exchange, is charged. Therefore the import duty is approximately 0.207 cent in American currency per pound gross.

Customs duties on automobiles and vehicles imported into Mexico are the same as on carriages intended to be drawn by horses, viz:

On first 100 kilograms (220.4 pounds), 60 cents Mexican per kilogram, net weight; from 100 to 250 kilograms (220.4 to 551 pounds), 55 cents per kilogram, net weight; from 250 to 500 kilograms (551 to 1,102 pounds), 50 cents per kilogram, net weight; from 500 to 750 kilograms (1,102 to 1,653 pounds), 45 cents per kilogram, net weight; from 750 to 1,000 kilograms (1,653 to 2,204 pounds), 40 cents per kilogram, net weight; excess over 1,000 kilograms (2,204 pounds), 35 cents per kilogram, net weight.

To illustrate: An automobile weighing 600 kilograms (1,322.6 pounds) would pay the following duties:

Description.	Duty.	
	Mexican.	
First 100 kilograms (220.4 pounds), at 60 cents per kilogram	$60.00	$25.50
Second 150 kilograms (330.7 pounds), at 55 cents per kilogram	82.50	35.06
Third 250 kilograms (551.1 pounds), at 50 cents per kilogram	125.00	53.13
Fourth 100 kilograms (220.4 pounds), at 45 cents per kilogram	45.00	19.13
	312.50	132.82
Plus 10½ per cent	32.81	13.94
Total	345.31	147.76

DEALERS.

The principal dealers in agricultural machinery and implements in this city (Mexico) are:

Fogarty & Dickinson, Primera San Francisco 7.
Mexico Mine and Smelter Supply Company, Primera San Francisco 12.
G. & O. Braniff & Co., Cadena 19.
Roberto Boker & Co., Coliseo Viejo 1.
Valentin Elcoro & Co., Cadena 24.
Korff, Honsberg & Co., Pte. Espiritu Santo 4.
A. Phillipp & Co. Sucrs., Empedradillo 5.
Sommer, Herrmann & Co., Coliseo Viejo 10.
Salcedo & Co., Capuchinas 6.

IMPORTING AGENTS.

Philip G. Roder & Co., 2a Independencia 8.
W. C. Gray, Gante 6.
William Young & Co., Gante 11
James C. Lohse, Cadena 14.
William Fink, Capuchinas 7.

ROADS, ANIMALS, AND VEHICLES.

Owing to the lack of good roads outside of the cities, farm wagons of American manufacture are impracticable. Rough native carts are in general use for freight purposes.

Most of the pleasure vehicles in use in Mexico are of American manufacture. The lack of pleasure drives even in the larger cities restricts the use of such vehicles. In general, the trade in vehicles of all kinds appears to be pushed as vigorously as circumstances will permit. The report on "Automobiles in Mexico,"* made by this office under date of May 14, 1902, covers that point. The import duties on automobiles therein given covers all vehicles. The fixed rate is charged when exchange is at 220 or less and the corresponding premium on gold is charged when it is more.

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*Printed in Advance Sheets No. 1489 (November 7, 1902). The extract relative to duties on automobiles and vehicles is inserted herein under "duties."

EDWARD M. CONLEY,
Vice and Deputy Consul-General.

MEXICO CITY, MEXICO, *September 15, 1903.*

VERACRUZ.

(*From United States Consul Canada, Veracruz, Mexico.*)

HAND LABOR VS. MACHINERY.

This consular district, covering the central and southern parts of the State of Veracruz, all of the State of Tabasco, and the northern part of the State of Chiapas, Mexico, with tropical and subtropical climates, is essentially an agricultural and cattle-raising country. The subtropical climate is found in the mountainous regions in the northwestern and southeastern parts of the district.

Its principal agricultural products are coffee, vanilla beans, rubber, tobacco, sugar cane, chicle gum, jalap, corn, and beans. Potatoes and many other varieties of vegetables are cultivated only to meet the demand of the local market. Corn, beans, and like products are generally cultivated in the higher altitudes, where—aside from the plow and some primitive farming implements—machines for preparing the soil, sowing, cultivating, and harvesting could not be utilized to such advantage as on the lower and more level lands. These lands are, as a rule, in small holdings in the hands of natives, each proprietor striving to do as well as he knows how and with the few appliances at his command to raise a crop sufficient for his own requirements. His surplus he disposes of in the immediate vicinity to those who may not have been so fortunate in this respect.

IMPLEMENTS IN USE.

On large plantations cultivating sugar cane, tobacco, cotton, etc., and also in the distillation of rum or aguardiente, which industry is usually conducted in combination with the manufacture of sugar, machinery is used extensively, much of it American and some French. German manufacturers in this line are vigorously pushing their wares in this market and keeping up a sharp competition for the trade. The gathering of coffee and vanilla beans, tapping rubber trees, etc., are accomplished purely by manual labor, as machinery can not take its place; but in the preparation of the soil for all the above-mentioned products mechanical appliances can be utilized.

Plows, cultivators, simple farming implements, sugar-making machinery, etc., have been preferred when of American origin. Modern bailing presses for cotton, broom root, and tobacco ought to find a good market here, this consular district having the reputation of being the best tobacco-producing section in the Republic. Machinery for the extraction, preparation, and baling of the several varieties of fibers should also find a market here. Gasoline and oil engines, for agricultural as well as mining purpose, for small plants now running with antiquated steam machinery, tools and appliances for tube wells, mechanical devices for irrigating purposes, coffee machinery (pulpers, hullers, separators), machinery used in the cultivation and preparation of rice, etc., should all find a market here, or rather the present trade therein should be increased.

VEHICLES, ROADS, AND DRAFT ANIMALS.

American vehicles are not on sale in this district; those in use have been either ordered directly from the United States or have found their way down here from Mexico City (probably the latter), where all kinds of vehicles are as plentiful as at the north. Imports of vehicles by way of the port of Veracruz, either for work or pleasure, during the fiscal year 1901-2 have not been very extensive, their total value amounting to $159,315 in Mexican currency ($75,000). England, France, and Germany supplied nearly the whole of these imports. The import duty on all kinds of vehicles is high. Parts of vehicles, such as axles, tire iron, carriage bolts, trace and bearing chains, etc., are all imported, and the United States gets the greater part of this trade. Draft harness, such as is made by natives, is of poor stock and workmanship.

Some time ago an enterprising Spaniard undertook to put a coach service into operation at Veracruz, but the venture proved disastrous for the owner and he was compelled to sell out his stock at auction.

Draft animals, among which the mule takes first rank, are small, light, and much abused. Horses are rarely used in harness in this district. They serve altogether for saddle purposes. Mules and burros do service as freight carriers, carrying their loads on their back. Milk is delivered by a man on a mule, with the milk cans in front and behind him.

The principal cities and towns in this district, where paved at all, use cobblestone pavements and are nearly always out of repair. They have a steep incline toward the center line of the street, thus forming an open drain. At the street crossings there are something like bridges crossing these gutters, and consequently the American style of vehicle, either for pleasure or freighting purposes, is not adapted for use at these places. At Veracruz may be found in service two or three antiquated buggies of the heavier kind and used by one or two of the medical profession; also several express wagons and one mail, one delivery, and one undertaker's wagon. All other vehicles are two-wheeled affairs for hauling merchandise. Riding for pleasure, if not on horseback, is altogether out of the question. The carts in use at Veracruz and other parts of the district are large and very heavy, with extra-heavy axles, without springs, and wheels broad, tired, and at least 6 feet in diameter. Three mules are attached, with rope and chain in place of harness, and they will haul 1 ton within the limits of the city proper. The outfit probably weighs more than the load carried. Vehicles more or less of the same description are in use throughout the district, when at all possible to utilize them. They are constructed of hard, well-seasoned native wood, are heavily ironed, and are very cumbersome affairs that can be heard several blocks off, owing to the rattling of the bolts and fastenings; but in their construction they are well fitted to withstand the terrible rocking they are exposed to and the extreme heat and heavy rains in these latitudes. I have yet to see a coat of paint on any one of them. With all these defects they are well adapted to prevailing conditions here and will hold together when an American cart, or any other vehicle, unless specially constructed, would fall to pieces in a short time.

Roads in this consular district, with the exception of several that were constructed before the era of railroads from the coast to points in the interior, still in existence and in fairly good condition, are bad; when compared with roads in the United States or Europe, they are practically not roads at all. Large plantation owners, at their own expense, have constructed such roads as will enable them to transport their products to rail or water for shipment, generally through their own property. Each county or community is required by law to keep open a road communicating with neighboring towns or villages. This, in most instances, merely consists of an animal trail. During the rainy season these trails, when not knee-deep with mud, are entirely under water and often impassable. In the dry season they are covered with several inches of fine dust, here and there intersected by water courses, forming mud puddles. The mountain roads or trails, aside from being steep and winding, are usually rocky and full of stones, very difficult for the hardy and tough little pack animals, when heavily loaded, to climb. A praiseworthy exception to this rule is the highway constructed by the present governor of the State of Chiapas, starting from the boundary of the State of Oaxaca on the Isthmus of Tehuantepec, a few miles from the Pacific coast, to Tuxtla Gutierrez, the present capital of the State of Chiapas, thence to San Cristobal, the former capital.

The entire length of the road approximates very closely 200 miles. It connects interior points of Chiapas with the railroad of Tehuantepec. This extensive territory is thus open to traffic for carts and other vehicles. Carriages, carts, all kinds of vehicles for freighting and farming purposes, and agricultural and dairy machinery could possibly be easily introduced and should find a ready sale here. The population is mostly "Mestiza" (Mexican and Indian blood), and the landowners are lineal descendants of the old Spanis settlers and natives.

HOW TO INCREASE AMERICAN TRADE.

Perhaps the most satisfactory and thorough way of introducing or increasing the trade with the United States in the line of manufactures under consideration would be to send competent and practical men to the several sections of this district, thoroughly canvass the territory to find out the needs of the people and the new articles that could be introduced and their chances to sell them, and then establish branch houses, fully stocked, at convenient ports and enter into competition with the products of other countries.

The next move should be to send out agents or salesmen—natives, whenever it is possible to procure them—who speak the language fluently and who have become familiar with the habits and customs of the people, to drum up trade. This is an absolute necessity, for the people are yet very conservative and they must be shown wherein the advantage of a new article consists before they will buy. The salesman or agent taking an order, as well as the manufacturer and shipper, must be scrupulously exact in all the details of the order, such as the price, terms of payment, quality, costs of transportation, erection of machinery, etc.—in fact, everything should be well understood between the buyer and the seller, to the end that the transaction may be perfectly satisfactory to both parties. The branch houses could be conducted with a view to handling the products of several manufacturing concerns, combining for the special purpose of introducing their goods at a minimum expense to each of the several parties.

Special arrangements might be entered into with old established houses, either German, Mexican, or Spanish, to take agencies for certain lines of goods; but it is well to note in this connection that American goods, in some instances, are fairly well represented in this market. In the lines of machinery and hardware there are concerns that keep a stock on hand sufficient for all usual demands, but these goods are in competition with those of other countries handled by houses with European connections established here for many years and conversant with the needs or requirements of the trade as at present conducted.

DEALERS IN AGRICULTURAL IMPLEMENTS.

The following is a list of firms and their addresses. Those marked with an asterisk (*) can be addressed in English.

Veracruz, Mexico.—Sommer, Hermann & Co.*; M. During & Co., Sucess.; R. Varela e hijo; and Colina Hermanos.

Jalapa, Veracruz, Mexico.—Carlos Bouchez, calle Enriquez, 18; Victor Camara; Manuel Mandoza Alva, calle Enriquez, 6; and Luis Cordero, Princip., 16.

Orizaba, Veracruz, Mexico.—Carrillo Hermano, calle las Damas; Francisco Liguori & Co.; Carlos Schmitz;* and J. Bello & Co.

Cordoba, Veracruz, Mexico.—Abascal Sucess.,* and Silvestre Iraola Hnos.

Coatzacoalcos, Veracruz, Mexico.—Frank W. Carpenter;* A. L. Guevara; S. Rodriguez & Co.; and Ruiz & Brunet.

Tehuantepec, Oaxaca, Mexico.—Alberto Langner;* Gervasio Jefferis;* Negociacion de Agencias y Embarques.*

San Juan Bautista, Tabasco, Mexico.—G. Benito & Co., Sucess.; J. Lamadrid.

Frontera, Tabasco, Mexico.—A. Gehm;* Romano y Co., Sucess.; and J. Dorenberg & Co.

Tuxla Gutierrez, Chiapas, Mexico.—Schauenburg & Co.* and Brauer & Spann.*

Alvarado, Veracruz, Mexico.—Francisco Vives.

Tlacotalpan, Veracruz, Mexico.—Jose L. Perez e hijos; Tomas Perez; and Luis Colina.

The present practice of flooding the country with catalogues, price lists, circulars, and advertisements may be made remunerative to the sender only in case the publications are printed in the language of the country for which they are intended, invariably giving illustrations. This consulate is receiving a great number of these publications, in rare instances printed in Spanish, and they are promptly mailed to all parts of the district where it is thought they may result to the benefit of American manufacturers. However, the average merchant in the interior is totally unacquainted with the methods of arranging for the importation of foreign merchandise. This has always to be done for him by experienced agents, well posted in custom-house requirements and shipping affairs, who will naturally charge for their services, to the detriment of the importer. The advantage of having a manufacturer's agency at port of entry is evident. About the only benefit derived from the small percentage of business literature that reaches interested parties may be that it calls their attention to something new, something that they have never before seen.

DUTIES.

The Mexican customs laws and tariff, like those of other countries, have their peculiarities. Any failure to comply strictly with their requirements will invariably result in annoying delays, heavy fines, double duties, and in some cases all of these combined.

In order to make entry of merchandise at the custom-house the consignee must present, in addition to the entry in triplicate, a duplicate list of the number of pieces or packages, the bill of lading, and the consular invoice from the shipper. (Copies of the first mentioned and of the latter also are attached hereto.*) Descriptions and declarations of the merchandise on these several documents must agree and be in harmony with each other and also with the contents of the packages containing the goods of which entry is intended to be made. Should the customs inspector on examination of the merchandise discover any error, discrepancy, or omission a fine or extra duties will invariably result. This will also be the case should the consular invoice be presented to the Mexican consul at the point of shipment for certification after the hour fixed for the departure of the transporting vessel or train. A like penalty is usually imposed should the inspecting officer find the goods wrongly classified or declared on the entry sheet and consular invoice. The description of merchandise on comparing commercial with consular invoice is sometimes so confusing that it is impossible for the consignee to determine by these documents the exact nature, quantity, or quality of the articles. In such cases it becomes necessary to make application to the customs collector for permission to make a preliminary examination, to enable the consignee to ascertain the requisite facts for making proper entry of the same if he would avoid a fine. The importance of presenting for certification a correct consular invoice is therefore apparent, and manufacturers, exporters, and shippers not familiar with the requirements of the Mexican customs laws should have recourse to the services of an experienced shipping agent.

Double duties are sometimes remitted or changed to a less amount, perhaps reduced merely to a fine, if application is made and satisfactory reasons are produced for a remission of the same, but the proceedings in such cases usually consume several months' time for their adjustment and the expenditure of from $5 to $10 for revenue stamps and other charges.

Under the Mexican customs laws, duties are specific and are levied on the piece or according to weight, either gross, legal, or net. The first and last terms are readily understood, but the term "legal" in this technical sense may not be familiar to Americans. It signifies the article or object imported, including its covering, wrapping, envelope, paper boxes, tin cans, etc., as the case may be, by which the separate articles are covered, inclosed, or contained, but does not include the exterior box, case, crate, or package containing one or more of these articles and in which they are packed for shipment. Thus it may be readily seen that in packing merchandise for shipment to Mexico, its classification for assessment of duty should be carefully taken into account. The packing of articles upon which duty is assessed by gross weight should therefore be strong enough to insure the safe delivery of the goods, yet not more so than absolutely necessary. If goods come under the classification of net weight they may be packed with a view to strength and easy handling; but in case the goods are classified as coming under the head of "legal," then the inner wrapping, covering, envelope, box, or can should be as light as possible without incurring the risk of breakage or injury by rough handling. Merchandise coming under different classification should, as far as possible, be packed separately. Small wooden boxes containing articles coming under the classification of legal weight should not be packed together in one large outer case. In order to provide the consignee with correct consular invoices, exporters of goods to this market should always ascertain under what section of the tariff the goods should be classified before packing same. They should know positively whether they come under the head of gross, legal, or net weight, and they should arrange for the packing as above indicated—if under net weight they should carefully ascertain that, and if under legal weight they should ascertain the weight of the articles when wrapped or packed in their usual covers before packing them in outer cases for shipment.

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* On file in the Bureau of Statistics, Department of Commerce and Labor, where they may be seen upon application by interested parties.

WILLIAM W. CANADA, *Consul.*

VERACRUZ, MEXICO, *June 26, 1903.*

CENTRAL AMERICA.

BRITISH HONDURAS.

(From United States Consul Avery, Belize, British Honduras.)

AGRICULTURE IN THE COLONY.

It is difficult to suggest any way to increase the market in this colony for agricultural tools or vehicles because the industry is yet in a most primitive state. The estimated area of British Honduras is about 4,839,408 acres, of which only 50,000 acres are under cultivation. Most of the land under cultivation is devoted to corn and sugar and to the planting and raising of fruits. This cultivation consists merely in clearing the plantations and keeping them clean. Corn, being the staple food of the population, occupies the largest area, and though the planting consists merely of making a hole in the ground and dropping the seed therein, the average return is over 50 bushels to the acre; yet the importation of corn for the last fiscal year was valued at $15,322.

AGRICULTURAL IMPLEMENTS IN USE.

Agricultural implements are but little used. As far as I have been able to ascertain there are not two dozen plows in the colony. The implement for nearly all uses is the always handy machete. The native uses it to clear the bush, dig holes for his seed, cut firewood, and for various household purposes.

The entries at the customs under the head of agricultural implements cover mostly shovels, axes, hoes, rakes, etc., and for the past year only $579 worth were entered besides those on the free list. It will give an exact idea of what is produced from the soil here—that is, by only primitive cultivation—to report the returns for 1902, as follows:

Sugar	pounds	1,417,477
Corn	bushels	16,494
Coffee	pounds	910
Rice	bushels	496

ROADS AND VEHICLES.

As the roads of the colony are only bridle paths, no vehicles are used in the country districts. In the few towns of the colony one may find American dogcarts and buggies.

HOW TO INCREASE AMERICAN TRADE.

Only as the population and demand increase will trade be augmented. There is no prejudice against American tools, implements, or vehicles, but as manual labor is so very cheap and no labor is exercised where it can be avoided, the present supply fully answers all requirements. An agricultural society was organized here a year ago to stimulate industry and production in British Honduras, and then, too, branches of the botanic station have been opened in some of the rural districts to teach the science of agriculture. Later on, as the native woods become exhausted, agriculture must be developed. Of vegetables there is only a small supply, though the soil should produce not only for the home market, but for the neighboring markets as well, and then the list of articles given in the circular will be in demand, though the very names are Greek at this writing to what must later constitute the farmers and planters of British Honduras.

W. L. AVERY, *Consul.*

BELIZE, BRITISH HONDURAS, *June 4, 1903.*

COSTA RICA.

(*From United State Consul Caldwell, San José, Costa Rica.*)

IMPLEMENTS IN USE.

The methods of cultivation here are, in the main, quite primitive. The plow is the crotch of a tree; corn is usually planted by digging a hole with a stick, dropping in the seed, and covering with the foot; the broad, curved machete is used to cut grass, weeds, etc.; the common, narrow machete, to fell trees, chop wood, etc. In coffee culture the broad shovel is used to turn the earth around the trees. Hoes, rakes, and forks are little used and very few scythes are seen. Machinery for husking and cleaning coffee is in use on many estates; some sugar machinery is also used. Several mines in operation are equipped with machinery, and some machinery is used in the culture of bananas. A number of small sawmills are found in the country, and there are several flouring mills, tanneries, ice plants, and soap factories. A few plows, mowing machines, pumps, and windmills have been imported. A considerable amount of wire fencing is in use.

AMERICAN IMPLEMENTS.

The agricultural and mining machinery now comes mostly from the United States. Coffee and sugar machinery, which came formerly to a great extent from England, now comes from the United States, as do also the broad machetes. Edge tools and cutlery come largely from the United States, this trade having been gained from England in recent years. Wire fencing on the Atlantic slope comes from the United States, but on the Pacific side it comes from Germany, being brought in in sailing ships.

ROADS, ANIMALS, AND VEHICLES.

Costa Rica is deficient in good roads. Outside of the towns and away from the railroads the common means of conveyance for passengers is horses and mules; for freight, ox carts. The roads during the rainy season become very bad, and in places almost impassable. In the dry season, while not much work is done on them, they are fairly well adapted to American farm wagons. The common ox cart is composed of a wooden body mounted on two wheels, the wheels usually solid, with a wooden axle. The old carts usually had the axle and wheels cut out of the trunk of a tree, but the spoke wheels and steel axles are coming into use. In the present condition of the roads the solid wheels are perhaps best adapted to the rainy season, but if broad-tired wheels become general the roads would in time become worn down. Carriages, for use in the towns, cart wheels, barrows, and carts are imported from the United States, though the importation is very small.

DUTIES.

Machinery for agricultural and mining industries is free of duty. Under this head are included coffee and sugar machinery and metal machines for grinding corn and other grains. This section of the tariff law admits of some latitude in its application. Picks and shovels for mining purposes are free and in certain cases might, and probably would, be admitted free for agricultural purposes. Barbed wire for fencing is free.

Import duties, gross weight per kilogram, including wharfage and special theater tax, reduced to American currency, are:

Article.	Duty.	Article.	Duty.
	Cents.		*Cents.*
Machetes	8.3	Cart wheels	2
Picks and spades	8.3	Coaches	16
Shovels:		Wheelbarrows, metal	38.3
Metal	8.3	Umbrellas and parasols:	
Wood	3.4	Silk	61.3
Pumps, metal	8.3	Cotton	30.6
Plows	2	Woolen	38.3
Carts	3.4		

AGRICULTURAL CONDITIONS.

Costa Rica is a mountainous country and consequently some portions are not naturally adapted to machinery. In the level parts the land needs to be cleared of rocks and the roots of trees—which in this tropical climate grow to a great length and make it necessary to use great care in breaking up the soil to avoid ruining the plow. Coffee and bananas, the two staple crops, have received the most attention, while the common cereals have been neglected. It is possible for the laborers, whose wants are few and whose lives are simple, to rent or buy a small piece of land, and, when that begins to require more cultivation and care to keep up the yield, to move to a new piece of land and begin again. There is much public land on which these people can settle, so there is no great need of even leasing. As a result of these conditions, the need of closer cultivation has not been keenly felt, and so the need of improved machinery and tools has not been great. The natural conservatism of the working people and their disinclination to adopt new methods have also much to do with the lack of appreciation of machinery. In the coast region of the Atlantic slope labor is scarce, and if the peons do not like to work where they are required to learn to use new machines and implements they can move on to some estate where there is no machinery in use.

HAND LABOR VS. MACHINERY.

The cost of labor, while low in comparison with the United States, is higher than in any of the neighboring countries, and labor-saving machinery can be profitably used. The large landowners appreciate its use and some of them have introduced machines on their estates. But it is necessary to patiently and persistently instruct and encourage the laborers in the use of these machines and implements until their conservatism and prejudice are gradually overcome and they appreciate the benefits for themselves; but this is a tedious process. These proprietors generally have other interests and can not remain constantly on their farms. Their foremen are often negligent and allow the peons to drift back into the old ways. So it sometimes happens that the new machinery is neglected and allowed to stand out exposed to the weather and speedy deterioration.

HOW TO INCREASE AMERICAN TRADE.

There is no immediate prospect of any great increase in the sale of agricultural machinery and implements. The increase will come slowly as more attention is given to cereals and as increasing scarcity of land makes closer cultivation and preparation a necessity. An increased supply of labor will make it necessary for the laborers to stick closer to their own vicinity and regular employment. Little by little attention is being turned to the increased production of cereals and small crops and to the improvement of the land. The use of machinery and modern appliances and tools is slowly increasing, and the United States controls the market, small as it is, at present and will undoubtedly continue to control it. All our manufacturers can do at present is to hold the market they already have, and by exercising care in the filling of orders, the packing of goods, and the granting of liberal terms of payment be ready to reap the benefit of the increased trade which is sure to come in time.

DEALERS AND FARMERS.

Leading dealers in implements and machinery in San José, are: Juan de Yengh, hardware; Macaya & Co., hardware; P. Rodriguez & Co., hardware; and Lyon & Cox, coffee machinery.

The names and addresses of some of the largest landowners are:

San José.—Ricardo Jiminez, Manuel Aragin, Dr. Carlos Duran, Dr. Daniel Nuñez, Dr. T. M. Calnek, Alberto Genzalez Soto, John M. Reith, Leon La Prade, Mariano Montealegre, Francisco Montealegre, Luis Fernandez, Federico Tinoco, Jaime Bennett, Thomas Scott, Ezequiel Gutirrez, José Rodriguez, Teodosio Castro, Julia v. de Rojas, Rafael Iglesias, Leonidas Peralta, Bernado Soto, and the Sociedad Nacional de Agricultura.

Liberia.—Federico Sobrado.

Turrialba.—Genaro Bonilla.

Heredia.—Esmeralda v. de Morales.

Sociedad Nacional de Agricultura will be glad to distribute copies of any reports or catalogues of interest.

JOHN C. CALDWELL, *Consul.*

SAN JOSÉ, COSTA RICA, *August 28, 1903.*

GUATEMALA.

(From United States Consul-General Winslow, Guatemala City, Guatemala.)

HAND LABOR VS. MACHINERY.

Owing to the cheapness of labor in this country, but little labor-saving machinery is in use; still, I believe if its advantages were better understood more would be employed. Notwithstanding the very low wages paid, labor is not so very cheap, as it takes ten or fifteen men to do the work of one American with labor-saving machinery. Especially is this true on the farm, where much of the ground is prepared by the pick or shovel. Of course in many places but little machinery could be used, for corn is raised on the mountain side where a horse or mule could hardly pass.

IMPLEMENTS IN USE.

Some farm machinery is in use on the sugar and coffee plantations, and most of it comes from Germany and England, as a very large amount of the capital invested in these lines comes from those countries. Besides, it is claimed to be cheaper, and the question of being up-to-date does not materially affect the matter.

ROADS, ANIMALS, AND VEHICLES.

In the matter of wagons and carriages there seems to be a preference for American-made goods, which are quite generally in use in and about Guatemala City; but as there are few roads in the Republic, their use is limited to a small territory, the pack mule doing the greater part of the work, even bringing much of the stove wood to the market in this city. A load for a mule is about 200 pounds, and with this he will travel from 15 to 20 miles a day.

HOW TO INCREASE AMERICAN TRADE.

With the currency question as unsettled as it has been for the past two years, there is little chance for increasing the sale of American agricultural implements or machinery of any kind in this country. The conditions are not encouraging, notwithstanding the fact that there is no country on the face of the earth where the agricultural resources are so great and varied as in Guatemala, nor is there any country where they could be developed with so little expense. Crops grow here very fairly by simply placing the seed in the ground. Corn is scarcely ever cultivated. The seed is simply put into the ground, which is very poorly prepared.

DEALERS.

Following are some of the most prominent importers of machinery and hardware in Guatemala City: W. J. Kelly, Furrer & Co., Van der Henst & Co., and Van de Putte & Co.

DUTIES.

Farm and industrial labor-saving machinery in general enters free of duty, and where there is a duty it is very low.

ALFRED A. WINSLOW,
Consul-General.

GUATEMALA CITY, GUATEMALA, *July 2, 1903.*

NICARAGUA.

(*From United States Consul Donaldson, Managua, Nicaragua.*)

HAND LABOR VS. MACHINERY.

The cost of hand labor is not sufficiently great to justify the general use of labor-saving tools and machinery. The common farm laborer receives from 60 to 70 centavos (10 to 12 cents) per day, and does most of his work with a machete, on which there is no duty.

ROADS, ANIMALS, AND VEHICLES.

The roads, although bad, are not unsuited to the use of American styles of vehicles, and the draft animals are easily trained for use with American-made vehicles, which are those most generally in use at present. Of course the heavy ox carts are made in the country. They have but two wheels, cut from a solid log, about 4 feet in diameter. A cart complete with frame, tongue, and side and bottom boards costs 100 pesos ($16).

AGRICULTURAL IMPLEMENTS IN USE.

Modern agricultural implements are seldom used in preparing the soil, sowing or planting the seed, cultivating during growth, and harvesting or gathering the crops. The few used are manufactured chiefly in the United States.

AMERICAN IMPLEMENTS IN USE.

American wagons and bicycles are in general use and are very popular. The trade can undoubtedly be increased by a little effort on the part of the manufacturers to introduce a good but cheap article. Owing to the high rate of exchange generally ruling here during the last two years, it is almost impossible for anyone except a wealthy person to own a bicycle or buggy. For instance, a $50 wheel would cost here in national currency $410, equal to nearly a year's salary for a Government clerk, a school teacher, bookkeeper, or clerk in a store. It is therefore evident that to sell a vehicle here it must be cheap and durable. It takes the common laborer here two weeks to earn enough to buy his machete, which is the instrument of all labor. With it he hoes, mows, plants, harvests, cuts wood for the fire, and clears the land for all agricultural purposes, but he prefers an American machete, even if it does take two days longer to earn the money to buy it.

HOW TO INCREASE AMERICAN TRADE.

The best way to introduce any article here is to get some house, with good standing, to represent the manufacturer as agent in each of the larger towns and cities.

It is well for our manufacturers who seek the extension of their trade to bear in mind the conditions which exist in Nicaragua. For instance, no hay is ever made or stored here, and therefore there is no use for haying implements. The animals eat green grass or cornstalks or run in the pastures all the year round. No grain is raised, except corn; therefore there are no thrashing or harvesting machines needed. Likewise, as there is no winter, no bobsleds or snow shovels are in demand; and the first automobile has not yet been introduced.

DEALERS IN AGRICULTURAL IMPLEMENTS.

Boyes & Co., of Managua and Leon; Luis Peugnet, of Granada; Juan Gabuardi, of Rivas; I. Cardoze & Co., of Masaya; Manning Brothers, of Matagalpa; Santiago Callejas, of Chinandega; Palacio & Co., of Corinto; Dr. Victor M. Roman, of Jinotepe, are all well-known business people and handle American goods.

DUTIES.

In the tariff list below I shall quote the duty only on articles used or appropriate for use in this country. The duties are assessed per kilogram (2.2046 pounds), and those here given have been reduced to American equivalents:

	Cents.
Agricultural implements	Free.
Axles	5
Binder twine	10
Buggies	6⅔
Boiler castings and all parts	Free.
Belting, as parts of machinery	Free.
Cornshellers	Free.

	Cents.
Carriages	6⅔
Carts	5
Cordage	10
Cornshellers, hand	Free.
Cutters, fodder	Free.
Evaporators, sugar	Free.
Engines (every kind)	Free.
Feed cutters	Free.
Farm trucks	Free.
Fencing wire, woven	Free.
Gasoline engines and pumps	Free.
Hardware and carriage specialties	6⅔
Harness:	
Common work	10
Carriage	16⅔
Implements, farm	Free.
Knives	16⅔
Locomotives	Free.
Machines:	
Road	Free.
Brick	Free.
Hand grist	Free.
Mill machinery	Free.
Mowers	Free.
Plows	Free.
Pumps, all kinds	Free.
Rock crushers	Free.
Rollers	Free.
Surreys	6⅔
Shovels, spades, etc	2
Spring wagons and carriages	6⅔
Wagons, farm	Free.
Windmills, pumps, etc	Free.
Wheelbarrows	6⅔
Well-drilling machines	Free.

CHESTER DONALDSON, *Consul.*

MANAGUA, NICARAGUA, *June 23, 1903.*

WEST INDIES.

CUBA.

CIENFUEGOS.

(*From United States Vice and Deputy Consul Casanova, Cienfuegos, Cuba.*)

HAND LABOR VS. MACHINERY.

The cost of hand labor is not sufficiently great to justify the use of labor-saving machinery by the agricultural interests in this consular district, the wages of a rural laborer at this season of the year being $25 in Spanish silver monthly and $30 during the sugar-grinding season, which is equivalent to $18 and $21.50 in United States currency, respectively. Furthermore, there is little disposition on the part of the rural laborers to adopt new and better methods with reference to labor saving in their various avocations. They have been known to throw aside the modern plow and take up the crooked stick as a means of stirring the soil, until required by their employer to resume work with the plow. This indicates their unwillingness to break away from the methods and customs of their ancestors and the difficulties that beset the path of an employer of rural labor.

ROADS, ANIMALS, AND VEHICLES.

The roads and draft animals are not suitable for the use of American styles of vehicles for pleasure and freight.

AMERICAN IMPLEMENTS.

The agricultural industry in Cuba is confined chiefly to the growing of sugar cane and tobacco, and it is my impression that on most of the leading plantations American plows, hoes, shovels, and, to a certain extent, American cultivators are used exclusively.

The American farm wagon is used in Cuba to a very limited extent. The two-wheeled cart has been used here from time immemorial, and its popularity and adaptability, both on the farms and in the cities, as a means of transferring freight seems in no immediate danger of decreasing.

On account of the yielding disposition of the soil, the planters say American steam plows can not be used here to advantage. American wheeled cultivators, such as are used in the cornfields in the United States, are not used here to any extent, because this is not the method employed in the cane for stirring the soil and keeping down the weeds.

HOW TO INCREASE AMERICAN TRADE.

I am unable to suggest the most effective means of introducing or increasing the trade in these articles.

I endeavor to give herewith a brief list of the articles that, in my judgment, would sell most readily in this consular district:

Agricultural implements.
Barn-door hangers.
Boiler fronts.
Boiler castings.
Leather belting.
Cultivators.
Cultivator teeth.
Hand cornshellers.
Engines.
Wire for fencing.
Harrows.
Farm implements.
Mower knives.
Detachable-link belting.
Locomotives.
Mowers.
Plow blades.
Iron pumps.
Pump supplies.
Plumbing supplies.
Scales.
Windmills and wheelbarrows.

DEALERS.

The leading importers in this city of farming implements and tools needed in the planting and cultivating of crops are: H. W. Klittke & Co., Antonio Copperi, Carlos J. Trujillo, and Jose Llovio.

DUTIES.

All farming implements and tools, such as plows, cultivators, hoes, shovels, etc., that are managed by hand or by horse power are admitted free of duty, the tariff (10 per cent) being imposed only on those implements that are operated by steam. All vehicles for pleasure or draft are subject to a duty of 25 per cent.

OSCAR S. CASANOVA,
Vice and Deputy Consul.

CIENFUEGOS, CUBA, *August 21, 1903.*

SOUTH AMERICA.

ARGENTINE REPUBLIC.

(*From United States Consul Mayer, Buenos Ayres, Argentine Republic.*)

HAND LABOR VS. MACHINERY.

The cost of hand labor is sufficiently great to justify the use of labor-saving machinery in my district.

ROADS, ANIMALS, AND VEHICLES.

The roads and draft animals are suitable for the use of American styles of vehicles for pleasure and freight.

AGRICULTURAL IMPLEMENTS IN USE.

Modern agricultural implements are used in preparing the soil, securing or planting the seed, cultivating during growth, and harvesting and gathering the crops. The most of these implements are of American make.

HOW TO INCREASE AMERICAN TRADE.

American agricultural implements, vehicles, and wagons are sold in my district and are very popular; the trade can be easily increased by selling on time. In my opinion, the most effective means of increasing the trade in these articles is not by corresponding with the dealers through the American consuls, but by sending men here who have been tested at home, who can speak the Spanish language to perfection, and who come here for business and not for pleasure, as many of them do.

The following-named articles will find sale in my consular district:

Agricultural implements.
Automobiles.
Axles, wagon and carriage.
Binder twine.
Buggies.
Baling presses.
Binders.
Brass goods.
Binder sickles.
Binder sections.
Binders, corn and grain.
Belting, leather.
Cultivators.
Corn planters.
Corn huskers.
Cornshellers.
Carriages.
Corn cleaners.
Castings, gray iron.
Carts.
Cultivator teeth.
Corn harvesters.
Cordage.
Evaporators.
Engines and thrashing and traction engines.
Engine tenders.
Fencing wire and woven fencing wire.
Farm trucks.
Foundry work.
Self-feeder for thrashing machines.
Furnaces.
Gasoline engines and pumps.
Gas-power plants.
Grain separators.
Harrows.
Hayrakes.
Hay tools.
Hardware and carriage specialties.
Harness.
Hayracks.
Hay carriers.
Harrows, spring.
Implements, farm.
Knives, mower.
Lawn swings.
Locomotives.
Machinery, harvesting.
Machines, road.
Mills, grinding.
Mills, steel.
Machinery, special mill and elevator.
Machinery, elevator.
Mower sections.
Mowers.
Machinery, flour-mill.
Machinery, thrashing, wire, fence, grain-seeding, road, grain-cleaning, hydraulic, brick, refrigerator, and small thrashing machines.
Mill supplies.
Mill machinery.
Mills, saw.
Plow blades.
Pumps, iron.
Phaetons.
Plows, wheel and walking.
Plows, gang and sulky.
Pumps, force.
Plows, chilled.
Pump supplies.
Plumbing supplies.
Potato diggers.
Potato sorters.
Potato cutters.
Pumps, spray.
Potato machinery.
Plows, shovel.
Rollers.
Road graders.
Reapers.
Scrapers, wheel.
Scales.
Surreys.
Shaft couplings and hardware specialties.
Store ladders.
Shredders, fodder.
Scrapers.
Shovels.
Spades.
Springs, wagon and carriage.
Sickles.
Truck rollers.
Trucks, log.
Trucks, gasoline-engine.
Tanks, steel.

Trucks, warehouse.
Transplanters.
Umbrellas, rain, sun, and wagon.
Vehicles.
Wagons, farm.
Windmills.
Windmill towers.
Wagon springs.
Wagons, freight.
Windmill pumps and tanks.
Wheels, metal.
Wagons, road.
Wheels, road.
Wagons, bike.
Wind stackers.
Wagons, mountain.
Wagon end gates.
Windmill regulators.
Wagons, delivery.
Wagons, express.
Wheelbarrows.
Wagon gears (platform springs).
Weeders.
Well-drilling machines and tools.
Wagons, lumber.
Wheels, carriage.
Wheel hoes.

DEALERS.

The houses in Buenos Ayers most likely to be interested in promoting this business are as follows:

Agar, Cross & Co., Calle Defensa No. 124.
L. Aischmann & Co., Calle Cuyo No. 1143.
Ayanz, Donadille & Co., Calle Bme. Mitre No. 2800.
Bailey, Walker & Co., Calle Balcarce No. 302.
George Bell & Sons, Calle Defensa No. 659.
J. I. Case, Calle Peru No. 447.
J. & J. Drysdale & Co., Calle Peru No. 450.
Thomas Drysdale & Co., Calle Moreno No. 438.
Fitte Brothers, Calle Moreno No. 834.
Geiger, De Bary & Co., Calle Reconquista No. 146.
Adolfo Mantels & Co., Calle Belgrano No. 602.
Goldkaul & Brostrom, Calle Belgrano No. 1099.
Hasenclever & Co., Calle Belgrano No. 667.
William J. Hodge, Calle Rivadavia No. 715.
Oscar Kroff & Co., Calle Pampa y Montaneses.
Miguel Lanus, Calle Anchorena No. 72.
Lindenbery, Nellen & Co., Calle Defensa No. 257.
Lockwood & Co., Calle Cuyo No. 631.
Moore & Tudor, Calle Maipu No. 140.
Morea, Mendizabal & Co., Calle Rivadavia No. 3000.
Ostwald & Co., Calle Balcarce No. 560.
Pruden & Hand, Calle Peru No. 437.
Rabba, Richard & Co., Calle Defensa No. 346.
John Shaw & Sons, Calle Venezuela No. 870.
Sillem, Collin & Co., Calle Patagones No. 557.
Charles D. Wood, Calle Peru No. 447.
Walsh, Lovett & Banham, Calle Belgrano No. 650.

DUTIES.

In order not to mislead the manufacturer, I must state that a new tariff law will be passed during the present session of the Argentine Congress, and as soon as possible I shall inform the Department of the result.

D. MAYER, *Consul.*

BUENOS AYRES, ARGENTINE REPUBLIC, *July 14, 1903.*

ROSARIO.

(From United States Consul Ayers, Rosario, Argentine Republic.)

HAND LABOR VS. MACHINERY.

The planting and harvesting of each of the principal crops of this region (corn, wheat, linseed, and cane) and the lack and consequent high price of hand labor is of so great moment as to fully justify the managers of farms to be on the watch for all mechanical devices possible to replace such labor. This applies to agricultural labor alone, for of manufacture there is so little here as not to be worthy of being taken seriously into consideration in this report.

ROADS, ANIMALS, AND VEHICLES.

Generally speaking, for a great part of the year the roads throughout this country, away from the few slightly improved towns, are the worst imaginable. They show little or no effort anywhere to improve them, even by ditching or any sort of drainage; and as for macadam or other filling or grading, that is only availed of in the near suburbs of the larger cities or towns. One good reason for this is the utter absence of stone or gravel, though a very good substitute in the way of good wood for "corduroy" is fairly plentiful and accessible. The draft animals, such as are most available for work under such conditions, are of the sort known as "burros"—short, small, and tough, never or seldom cleaned, fairly well fed, and worked, by merciless drivers, till they can no longer go, when they are left to die and are replaced by others. It should, under such circumstances, probably go without saying that, through the agricultural parts, the roads are emphatically not suitable for the light American styles of freight and pleasure vehicles. Within a radius of 1 or 2 miles of the principal cities (as, for instance, Rosario) the roads are fairly passable, well kept, and keep to property lines, but in the interior there are hundreds of miles of territory where, the lands being unfenced, the only aim of the carter is to avoid the ruts and mudholes of the previous carts, and the way is consequently very devious and can scarcely be dignified by the name of road. The kinds of vehicles used in inland transportation are still, by reason of the above-mentioned conditions, of the most primitive character, consisting largely of great, heavily framed and awkwardly constructed two-wheeled carts, the wheels being from 6 to 8 feet in diameter, with tires from 3 to 4 inches wide; hubs, spokes, and fellies rough and very heavy, with shafts of square, straight timbers about 4 by 4 inches, and bed of heavy planking of the hard woods of the country—all perched up, with its 4 feet of height, on those high wheels, till the pulling power of the poor little burro is, before a pound of load is added, quite sufficiently taxed to drag the empty cart. Loaded, it is usual to hitch on, by hook and single trace to each side of the ungainly shafts, one or more fellow-burros, and the way these little helpers get down at a lateral angle of about 30° and fairly hug the ground to pull is a wonder. This vehicle is occasionally varied, in the case of a better settled condition of surface ways, by a little lighter, but still uncouthly and roughly made, four-wheeled wagon, of less diameter of wheels and with a lighter and lower bed than the above-mentioned cart, and to which, ahead of its shafts, one, two, and sometimes three little horses are, seemingly, promiscuously hitched (there seems no known method here of utilizing horsepower), and this is the nearest approach to any modern attempt at transportation I have witnessed in my district. For heavier loads, such as wheat or corn in bags, to be taken to the railway station, I have seen as many as 10 or 12 bullocks, hitched in the same promiscuous manner, attached to a heavily built platform wagon. In a dry season, when the muddy ruts have become somewhat worn down, these powerful, splendid animals are able to draw almost incredible loads. In cities like Rosario, where the streets and boulevards are smooth and well finished, the finest and lightest vehicles are available for pleasure, and the best and most modern strong transfer wagons for heavy hauling, besides the more ornate varieties for milk, bread, etc.

AMERICAN IMPLEMENTS.

The farmer of these regions is quite alive to the advantages of the use of modern appliances in the preparation of the soil, as well as in the planting, cultivation, and harvesting of his crops, and the general consensus of opinion from the most reliable and disinterested sources is to the effect that the European machines, by reason of being too cumbersome and heavy for the purposes and for facility of transportation and use, are being, year by year, as they become old and worn, supplanted by our American machines. Every farmer is, by reason of self-interest, forced to adopt these modern appliances, and of course seeks the best available machines of the different sorts.

HOW TO INCREASE AMERICAN TRADE.

The introduction of American agricultural machinery has already, by our most enterprising and wide-awake manufacturers, been very thoroughly set on foot by the only practical means, *i. e.*, by sending practical, Spanish-speaking men through the country to call attention to their capabilities and excellences, to set up and operate samples of them, and, finally, to establish agencies for their sale in the principal centers, whence they can be shipped to probable purchasers. The representative of the manufacturer being here on the ground, with an established acquaintance with the banks, etc., can ascertain the financial standing of those firms which would make proper agents for the handling, in their behalf, of the machines they offer, and to such as are found reliable such terms as would be attractive, both as to time and discount, should be freely made. This suggestion is especially applicable to the cases of new and not yet established and well-known machines.

DEALERS.

The following are some of the leading houses in this city (Rosario) who are dealers in the lines specified:

Chiesa Brothers.
Angel Muzzio & Son.
Adolfo Mantels & Co.
Guillermo O. Schneider.
Lanus & Marmol.
E. Brusaferri & Co.
Remonda, Monserrat & Co.
Hasenclever & Co.
Rabba, Richard & Co.

James M. Ayers, *Consul.*

Rosario, Argentine Republic, *July 23, 1903.*

BRAZIL.

(From United States Consul-General Seeger, Rio de Janeiro, Brazil.)

ROADS, ANIMALS, AND VEHICLES.

There are no pleasure vehicles used, and, with rare exceptions, driving would be anything but a pleasure on account of the roads. Not only topographical and climatic difficulties militate against the introduction of American implements, vehicles, etc., but also lack of transportation facilities, absence of roads, bridges, etc.

AMERICAN IMPLEMENTS.

There is an inconsiderable trade in American tools and implements, but it can be increased.

HOW TO INCREASE AMERICAN TRADE.

In certain parts of Brazil, the middle States, and in the three southern States—Paraná, Santa Catharina, and Rio Grande do Sul—there is undoubtedly a good market for the articles appended to the Department circular.

I have repeatedly called attention, during the last few years, to the fact that a great crisis prevails in Brazil, and consequently new commercial ventures are precarious and hazardous. In many cases, however, a good market could be created—not by trade circulars or by appeals to consular officers, but by a systematic effort on the part of men who know their business thoroughly and speak the language of the country. Wherever Europeans in Brazil monopolize the markets and succeed in excluding the imports of American manufactures, which, as a rule, are superior to theirs in most branches, it is exactly through such efforts.

In this connection, I want to quote part of a letter which the recent vice-consul-general, Mr. L. C. Irvine, has sent me in regard to this matter. He has been for a great many years prominently connected with Brazilian commerce, and his experience and opinion are very valuable:

> The most effective means, and the only means, of building up business is the method in use at home. Why American manufacturers, who know perfectly well that the only way to do business in the United States is to send out their representatives to work up trade personally, should expect to accomplish much in other countries by sending out catalogues and circulars, is beyond comprehension. If American manufacturers are really in earnest about entering the South American markets, they must put some money into the venture and send out competent men to establish agencies and study, as experts, the needs and possibilities of these fields. Consuls can only suggest broad lines of action; the business man must supply the "push," enterprise, and care of details. Why should American merchants expect the Brazilian merchants to extend any more confidence to us than we are willing to bestow on them? South America offers vast opportunities to American enterprise and capital, but we shall never get our fair share of all this until our business men are willing to work for it as earnestly as others are doing.

For most of the articles there is either a market or one could be created under certain conditions, and particularly in the manner indicated above. I give a list here of those articles in the list sent that would sell most readily in my district:

Agricultural implements.
Axles, wagon and carriage.
Buggies.
Bailing presses.
Brass goods.
Belting (leather).
Cultivators.
Corn planters.
Corn huskers.
Cornshellers.
Carts.
Dump carts.
Drays.
Delivery vans.
Thrashing engines.
Feed cutters.
Fencing wire.
Farm trucks.
Fencing, woven-wire.
Fencing, wrought-iron.
Harrows.
Hardware and carriage specialties.
Horsepowers.
Horse hoes.
Harrows, pulverizing.
Implements, farm.
Link belting.
Locomotives.
Mills, grinding.
Mills, cane.
Machinery, road.
Plow blades.
Plows, wheel and walking.
Pumps.
Plumbing supplies.
Planters (corn), hand.
Rock crushers.
Scales.
Shaft couplings and hardware specialties.
Windmills.
Windmill pumps.
Windmill regulators.
Wheelbarrows.
Well-drilling machines and tools.

Nearly all the information requested in the above circular is contained in my annual reports for the years 1900 and 1901, and in many subsequent special reports.

DEALERS.

The principal dealers in agricultural implements and vehicles are the following: Messrs. Hampshire & Co., Rio de Janeiro; Messrs. Henry Rogers' Sons & Co., Rio de Janeiro; and Messrs. Lion & Co., Sao Paulo.

DUTIES.

Agricultural and mining implements and machinery are nominally admitted free of duty, but they are subject to several fees and harbor dues, which are not inconsiderable, and may be said to amount to about 10 per cent ad valorem. Machinery not strictly for tilling the fields and harvesting pay from 15 to 25 per cent; carts, carriages, and their fittings are taxed from 50 to 60 per cent, except that vehicles unfinished, without varnish, upholstering, etc., pay only 30 per cent; and carriage bodies, 15 per cent. The actual duties frequently amount to much more than the rate named, as in most cases a fixed artificial and official value is given to each article and the duties are assessed upon this instead of on the actual cost.

EUGENE SEEGER, *Consul-General.*

RIO DE JANEIRO, BRAZIL, *July 31, 1903.*

HOW TO INCREASE AMERICAN TRADE IN BRAZIL.

The following report from United States Consul K. K. Kenneday, of Para, Brazil, calling attention to the methods by which merchants and manufacturers may best be assisted in building up foreign trade, while not written to cover agricultural implements, confirms what United States consuls in other parts of the world have said:

The American firm which seeks to conquer foreign lands has an important lesson to learn and would better study it carefully and thoroughly before making the attempt to introduce its goods.

In striving to build up foreign trade the fact must not be lost sight of that the people must be addressed in their own tongue; thus not only correspondence, but catalogues, pamphlets, circulars, and all advertising literature should be printed in the language of those to whom it is addressed. Talk to the Russians in the Russian language; French should be used in France, German in Germany, Spanish in the South and Central American republics, Mexico, and Spain, Portuguese in Brazil, etc.

Never solicit foreign trade without literature printed in the native language of the people whose trade you desire.

The American catalogue is usually an exquisitely beautiful brochure, the product of the best talent, science, and skill in the printing world; but to be effective it must be understood.

It is hardly to be expected that even the most intelligent foreigner will trouble himself to have a translation made of American advertising matter unless he has a very special reason for so doing—a case which very seldom occurs. What he sees in his own language he will very readily understand. But how about foreign moneys, weights, measures, capacities, and the like? Foreigners can not be expected to be posted in these technical matters.

It is impossible to get a footing in foreign countries without hard work. You must "go after it." The catalogues used should be of individual character, designed to meet the special conditions that are to be met, and to tell the foreigner in his own language all that can be told about the goods offered for his consideration. The minutest details are of importance. The matter of foreign correspondence is also important. Each letter should be made clear and explicit and no essential detail forgotten, leaving no loophole for misunderstanding.

Remember well, when considering these things, that different terms are used in various countries to express the same meanings. When you tell a man in his own language about things no misunderstanding is likely to occur.

American manufacturers, I am happy to report, have in recent years more closely studied foreign countries, particularly South America, to discover markets for their wares; and when they have found conditions favorable they have, after strictly observing local requirements as relates to license and securing the necessary protection of the trade-mark laws, promptly entered this remunerative field or essayed to educate an indifferent public to new desires.

It is, or at least it ought to be, much easier to supply a foreign people with what they want than with what we think they ought to have. It should not be forgotten that advertising in the local papers has been the valuable key which in either case has unlocked the strong door of prejudice or utter indifference, and the publicity attached to this process has not only aided largely in securing the coveted market for the article advertised, but has also helped to create a market for other American goods.

Thus every article of merit which the United States sends to foreign markets and properly and systematically advertises makes it easier for each succeeding effort. We have built up here a strong and steadily growing demand for our food products. If people eat our cereals and find them superior, they can be much more easily induced to try our coal, shoes, wares, furniture, implements, etc. Just so long as we continue to send superior goods to foreign markets will our exporters find public opinion and individual judgment more and more inclined to seek Yankee goods.

Every American advertising success abroad stimulates a wider range of exports and makes the way smoother and easier for all concerned.

I have seen this United States consulate equally as crowded by local merchants seeking information as the office of a famous advertising agent. All the leading trade papers in every line of business are received here, carefully classified, and placed ready for immediate reference. By this complete system of filing the export and trade papers I can at once give a list of American houses dealing in or manufacturing the goods required.

I have pointed out as best I can the peculiar needs of this locality; the likelihood, or the reverse, of probable markets for different lines of goods; the pitfalls to be avoided; the pathways to be followed. There is yet plenty of room here for men who can build, command, and hold trade.

One other error our exporters make, which probably costs them many thousands each year, is their practice of lettering the bales and cases containing their goods in English. I have often seen at the custom-house here boxes, etc., labeled, "Fragile; handle with care." Or, in other cases, "This side up, with care." Now, as a matter of fact, we might as well expect a stevedore in New York to read the labels on a Chinese tea chest as to ask the men who handle foreign goods in this port to read English. It gives them trouble enough to decipher their own language when plainly printed. Consequently, when the bale, package, or case enters the steamer at New York, all warnings, caution, or advice printed upon it might as well be done in uncial Greek as in English.

K. K. KENNEDAY, *Consul.*

PARA, BRAZIL, *September 9, 1903.*

BRITISH GUIANA.

(From United States Consul Moulton, Demerara, British Guiana.)

HAND LABOR VS. MACHINERY.

Agriculture, as applied to this district and the purposes of this report, means chiefly the cultivation of the sugar cane, rice, plantains, and ground provisions.

The estimated area of those products under cultivation is 74,000, 12,000, and 5,000 acres, respectively. The so-called plantain and provision farms are mere truck gardens of from half an acre to 5 acres. Very few farms embrace as much as 40 acres.

The cost of hand labor varies from 32 to 48 cents per day on the sugar estates and farms.

IMPLEMENTS IN USE.

Successful experiments in mechanical plowing are being made on one of the local sugar estates. It is claimed that it will cost less than hand labor and result in a great saving in time. The plow is operated by oil engines and a wire cable from punts in the drainage canals on each side of the beds to be plowed.

The manufacture of sugar offers a good field for the introduction of improved machinery. Other manufacturing plants are one shoe factory, one biscuit factory, and two wood-working and planing factories.

Hoes, forks, shovels, and cutlasses of suitable and modern patterns are the chief implements used in preparing the ground and sowing, cultivating, and harvesting the crops. The rice fields of considerable area are plowed with the root of the guava tree, to which a smith has fastened an iron plow point, and is drawn by an ox.

The hoes, shovels, forks, and cutlasses imported here are made mostly in England. A few come from the United States. They are classified at the local customs department as hardware.

ROADS, ANIMALS, AND VEHICLES.

Roads are very good and the draft animals quite suitable for American styles of vehicles for pleasure or freight. Carts are most used for hauling freight. They are of two sizes—mule carts and donkey carts—with capacities of 1 ton and half a ton, respectively.

HOW TO INCREASE AMERICAN TRADE.

The most effective way of introducing improved implements and vehicles would be to study the requirements of the market and exhibit a line of samples adapted to its need and push sales persistently.

From the list of manufactured articles submitted, the following should sell most readily here:

Agricultural implements.
Axles, wagon and carriage.
Brass goods.
Belting, leather.
Cultivators.
Corn planters.
Corn huskers.
Cornshellers.
Carriages.
Carts, donkey and mule.
Cornshellers, hand.
Dump carts.
Delivery vans.
Engines.
Engines, traction.
Fencing, wire.
Fencing, woven-wire.
Foundry work.
Hardware and carriage specialties.
Harness.
Horse hoes.
Machines, road.
Mills, saw.
Mills, cane.
Mowers, lawn and pony.
Pumps, force.
Pump supplies.
Plumbing supplies.
Planters (hand) corn.
Scales.
Surreys.
Store ladders.
Shovels.
Spades.
Scoops.
Sickles.
Vehicles.
Wagons, spring.
Wheels, road.
Wagons, delivery.
Wheelbarrows.
Wagon gears (platform springs).
Wheels, carriage.

DEALERS.

The leading importers and dealers of articles under consideration are Booker Brothers; McConnell & Co. (Limited); Smith Bros. & Co. (Limited); and J. P. Santos, all of Demerara.

DUTIES.

The tariff on implements and vehicles is 15 per cent and 5 per cent surtax. Sugar machinery and all machinery for the manufacturing of local products are duty free.

GEO. H. MOULTON, *Consul.*

DEMERARA, BRITISH GUIANA, *June 19, 1903.*

CHILE.

(From United States Consul Mansfield, Valparaiso, Chile.)

HAND LABOR VS. MACHINERY.

The cost of hand labor in agricultural pursuits in Chile is not sufficiently great, as a rule, to justify the employment of labor-saving machinery. Farm laborers receive from 10 to 20 pesos per month (15 to 25 cents American per day). The labor, as is the case where the compensation is low, is generally unreliable and unsatisfactory, the laboring classes having little sense of responsibility or ambition to better their condition.

IMPLEMENTS IN USE.

Generally speaking, the agricultural implements in use in Chile are crude and primitive, in many instances being patterned after those used in Spain and other European countries a century ago.

There are, however, some modern harvesting machines, self-binders, and steam thrashers in use. Some farmers also use modern plows, drills for planting the wheat, barley, and oats, and machines for planting the corn. There is little corn grown in this country, except for cooking purposes. It is used, in a small way, for feed for animals or for manufactured food supplies.

AMERICAN IMPLEMENTS.

The introduction of labor-saving machinery into Chile for agricultural purposes in recent years has created an interest that promises well for the future, and the prospects are for an increased and constantly increasing trade in agricultural implements, farm machinery, and vehicles. It is encouraging to the manufacturers of this class of goods in the United States that the majority of farm machinery and implements imported into Chile are of American manufacture. The latest available statistics show that of all machinery applicable to farm use imported into Chile, 37.5 per cent came from the United States; of that properly classified as agricultural implements, considerably more than one-half is of American manufacture.

Another class of machinery that is allied to agriculture is machinery for flour mills, a number of which are in operation in Chile, practically all using machinery of American manufacture.

HOW TO INCREASE AMERICAN TRADE.

The best method of increasing trade in the class of articles included in this report, and as indicated in the Department circular, is by personal representatives, who can speak the language of the country and who have a thorough knowledge of the business. Salesmen unfamiliar with the language, or who are new to the special line of business they are sent to introduce, had better remain at home.

The second best method of reaching the trade in Chile is to secure as agents some well-established firm doing business in the country, who knows the trade and its requirements, and give to one house or firm the exclusive agency of a certain line of goods. To place the same business in the hands of two or more firms usually results in neglect of the business through lack of interest on the part of the several persons handling the goods.

ROADS, ANIMALS, AND VEHICLES.

The roads in Chile are not suitable to the use of American-style vehicles. There are few improved roads, and much of the country is mountainous and inaccessible for vehicles of any kind. The class of vehicle most common to Chile is the two-wheeled cart. It is a heavy, cumbersome, crude affair, and in this country is invariably drawn by oxen. In the cities and towns carts are also used for transporting freight and cargo of all kinds, but instead of oxen horses are used as draft animals. On the country roads, and especially in the hill country, all classes of freight are transported upon the backs of horses and donkeys.

About the only American vehicles in use in Chile are carriages. Buggies, phaetons, traps, and light road wagons find no sale here for the reason that there are few improved roads or well-paved streets.

DUTIES.

There is no import duty on agricultural implements or machinery.

The duty on vehicles, carriages, etc., such as are in demand here, is 60 per cent ad valorem.

DEALERS.

Prominent importers of the class of goods mentioned in the Department's circular and included in this report are: W. R. Grace & Co.; Beeche, Duval & Co.; Rattray & Co.; Willshaw Bros. & Co.; Rose Innes & Co.; Juan E. Clark; and Limozin & Co.—all of Valparaiso.

R. E. MANSFIELD, *Consul.*

VALPARAISO, CHILE, *August 12, 1903.*

COLOMBIA.

(From United States Consul Colvig, Barranquilla, Colombia.)

HAND LABOR VS. MACHINERY.

The cost of common labor seems to be so low that labor-saving machinery is not desired in this country. The wages, reduced to American currency, paid here per day, without board and lodging, are as follows:

Railroad section men	$0.50
Laborers engaged in dairy work	.40
Brickmakers	.30
Street-car drivers	.60
Street-car conductors	.60
Common laborers in mills	.30
Engineers on steamboats	1.00
Railroad brakemen	.50
Common laborers	.30

ROADS, ANIMALS, AND VEHICLES.

There are no roads in the country for vehicles, and the entire travel and carrying trade is done by steamboats, burros, and mules. Outside of the cities and large towns there are no wagons, and footpaths are the only roads leading into the country.

The Magdalena River and its numerous branches cover a vast territory, and by these the people convey the greater part of the produce to and from the markets.

The beast of burden in general use is the burro, which is employed in carrying cargoes and for travel. In the large towns coaches are employed for carrying passengers, while the freight is conveyed to and from depots and warehouses by two-wheeled carts drawn by one mule. The horses employed on the coaches are small and inferior, and the same may be said of the mules.

AGRICULTURAL IMPLEMENTS IN USE.

The implements used in planting and gathering crops in this valley are the "machete" and the hoe. There are no reapers, mowers, or harvesters in use, nor plows of any description. All the labor of planting and harvesting is performed with hoe and machete by peon laborers.

DEALERS.

There is no person or firm in this consular district engaged in the sale of vehicles or implements of agriculture. The coaches in use in this city have all been ordered from the United States. Hoes and machetes are kept in stock by dealers in hardware.

Firms likely to handle these lines of American goods are not numerous in this city, and those who might be induced to engage in such trade are: F. Carbonell & Co., O. Berue & Co., Flohr, Price & Co., and Arthur Stegmann & Co.

HOW TO INCREASE AMERICAN TRADE.

The American make of coaches is satisfactory, and the trade in vehicles could be increased if a sales room were opened with a display of modern buggies, carriages, coaches, and carts.

The country being at peace, times are improved, and there is reported a marked activity in trade on all lines represented.

In this city (Barranquilla) of 50,000 inhabitants there is no American merchant or firm engaged in business, the trade being largely in the hands of German and other European merchants.

DUTIES.

The tariff duties quoted below are carried out in the current money of this country, a paper peso of which consists of 100 centavos. The present rate of exchange between this currency and United States gold makes 1 peso equivalent to 1 cent in United States money. All duties are levied on gross weight and are quoted in the following table per kilogram (2.2046 pounds):

Article.	Duty.
	Pesos.
On all machinery weighing over 1,000 kilograms (2,204 pounds), whether constructed of wood or iron	0.45
Agricultural implements (iron)	1.25
Axles, wagon and carriage	2.25
Binder twine, iron	9.00
Buggies	2.25
Baling presses	2.25
Boilers	2.25
Brass goods:	
Of less than one-half kilogram	22.50
Of more than one-half kilogram up to 25 kilograms (155 pounds)	18.00
Of more than 25 kilograms	9.00
Belting, leather	2.25
Cultivators	1.25
Carriages	2.25
Corn cleaners	2.25
Carts	2.25
Cordage	2.25
Dump carts	2.25
Drays	2.25
Delivery vans	2.25
Engines, thrashing and traction	1.25
Furnaces	9.00
Grain sieves	18.00
Harrows	2.25
Hayrakes	2.25
Harness	4.50
Locomotives	1.45
Mills:	
Grinding	2.25
Saw	2.25

Article.	Duty.	Article.	Duty.
Mills—continued.	*Pesos.*		*Pesos.*
Cane	1.25	Umbrellas	36.00
Corn	1.25	Vehicles	2.25
Hand grist	2.25	Windmills	2.25
Plow blades	1.25	Wagons, spring	2.25
Pumps:		Windmill pumps	2.25
Wooden	18.00	Wheels, metal	2.25
Iron	2.25	Wagons:	
Plows	1.25	Mountain	2.25
Shovels	2.25	Delivery	2.25
Spades	2.25	Express	2.25
Springs, wagon and carriage	2.25	Wheelbarrows	1.25
Sickles	2.25	Weeders	1.25
Trucks	1.25	Wagons, lumber	2.25
Tanks	45	Wheels, carriage	2.25
Trucks, warehouse	1.25	Wheel hoes	2.25

GEO. W. COLVIG, *Consul.*

BARRANQUILLA, COLOMBIA, *June 9, 1903.*

ECUADOR.

(*From United States Consul-General Dietrich, Guayaquil, Ecuador.*)

The cost of hand labor is very small, added to which the lack of knowledge in the use of labor-saving machinery has, up to the present, caused the imports to be very small. There is little manufacturing interest in this district.

Only a small portion of the roads is suitable for the use of vehicles. The greater part of freight is carried on mule back.

Only a very limited number of agricultural implements are used in this country. The few implements imported were brought principally from the United States.

There have been a few American agricultural implements and vehicles sold in this district, and more could be sold if they were properly exhibited and explained.

The most effective means of introducing or increasing the trade would be by sending an agent who is thoroughly acquainted with the use of the articles and is also conversant with the Spanish language.

Messrs. R. B. Jones, Gonzalez Rubio & Co., Descaliz & Co., and Duran & Co. might act as agents.

The tariff rate on vehicles is 10 sucres (4.87 cents United States) per kilogram (2.2 pounds), and on agricultural implements 50 sucres (24.4 cents United States) per kilogram. The sucre is worth 48.7 cents in United States currency.

HERMAN R. DIETRICH,
GUAYAQUIL, ECUADOR, *July 17, 1903.* *Consul-General.*

PARAGUAY.

(From United States Consul Ruffin, Asuncion, Paraguay.)

HAND LABOR VS. MACHINERY.

The cost of hand labor here is very cheap, but owing to its scarcity the use of labor-saving machinery is greatly appreciated, though there is not much in the country.

ROADS, ANIMALS, AND VEHICLES.

At present the roads outside Asuncion and the smaller towns are principally traversed by carts drawn by oxen. In some cases coaches of a rude nature carry passengers and light freight from one town to another; these are almost always drawn by mules. Only in the towns (none of which are very large) could American styles of vehicles be used. The making up of roads is now being carried on, and it is expected that shortly the outside roads will be greatly improved.

IMPLEMENTS IN USE.

Agricultural implements are not used to any great extent, and those imported come mostly from the United States. Cultivation is only carried on to a small extent here and there, not necessitating large machinery excepting in a few cases.

AMERICAN IMPLEMENTS.

American agricultural implements are sold here and a few vehicles have been sold. Those implements and the few vehicles that have been sold here as a rule give satisfaction. Two-wheeled buggies, for instance, are rated at $30 and a duty of 55 per cent is charged on them; this, with the heavy freight, hinders the advancement of the sale of this class of goods.

HOW TO INCREASE AMERICAN TRADE.

The most effective way of introducing and increasing the trade in these articles would be for the merchants dealing in them to send duplicate or triplicate catalogues, and for a good active broker to take the run of the trade and receive orders. Catalogues can be sent to this consulate for reference in time of need.

The following is a list of articles most readily sold here:

Buggies (2 wheels).
Binders.
Binder sickles.
Binder sections.
Cultivators.
Corn planters.
Cornshellers.
Corn harvesters.
Cornshellers, hand.
Drills, grain.
Drills, corn.
Fencing wire.
Harrows.
Hayrakes.
Hay tools.
Harrows, disk.
Hayracks.
Horse hoes.

Implements, farm.
Mills, cane.
Plow blades.
Pumps, iron.
Plows, wheel and walking.
Plows, chilled.
Shovels.
Spades.
Scoops.
Transplanters.
Windmills.
Windmill pumps.
Windmill tanks.

Fencing wire is used extensively, but the above-mentioned implements only on a small scale.

DEALERS.

The names of two of the leading houses most likely to be interested in the promotion of this business are Messrs. Rius y Jorba and Messrs. Crovati y Rodi, both of Asuncion.

DUTIES.

All implements of agriculture come in free of duty.

JOHN N. RUFFIN, *Consul.*

ASUNCION, PARAGUAY, *July 16, 1903.*

VENEZUELA.

(From United States Consul Goldschmidt, La Guaira, Venezuela.)

HAND LABOR VS. MACHINERY.

I do not consider the cost of hand labor high for agricultural work. For manufacturing, many labor-saving implements might be used.

ROADS, ANIMALS, AND VEHICLES.

The roads are not suitable for American styles of vehicles, and draft animals are rather small for any ordinary vehicles for freight. The lighter kind of pleasure vehicles could be used if the roads were not so bad.

IMPLEMENTS IN USE.

Modern agricultural implements are used very little either for preparing the soil or for planting or cultivating, the most primitive methods being still in vogue.

AMERICAN IMPLEMENTS.

To my knowledge no American agricultural implements are sold here.

HOW TO INCREASE AMERICAN TRADE.

The only suggestion I could make as to how to introduce such implements would be that some demonstration of their practical use would be made by interested parties. This would be rather difficult, and even then I doubt if any great amount of business would be secured. My reasons for this are: (1) The geological formation of the country, which is mostly mountainous, excepting the vast plains of the interior which receive very little cultivation; (2) the difficulty encountered in introducing any innovation and the general feeling of doing as has been done in the past and of being satisfied with limited production.

The following is a list of articles which might sell most readily if properly introduced:

- Agricultural implements.
- Axles, wagon and carriage.
- Brass goods.
- Corn planters.
- Corn huskers.
- Cornshellers.
- Castings, malleable.
- Castings, gray iron.
- Carts.
- Cordage.
- Dump carts.
- Fencing wire.
- Horsepowers.
- Hardware and carriage specialties.
- Harness.
- Horseshoes.
- Implements, farm.
- Mills, saw.
- Mills, cane.
- Machines, brick.
- Plows, wheel and walking.
- Plumbing supplies.
- Scales.
- Shovels.
- Springs, wagon and carriage.
- Sickles.
- Trucks, warehouse.
- Umbrellas, rain and sun.
- Vehicles.
- Wagons, farm.
- Windmills.
- Windmill towers.
- Windmill pumps.
- Wheelbarrows.
- Well-drilling machines and tools.

DEALERS.

The following are the leading dealers in hardware, who might be interested to some extent in promoting this business: Becker Buen & Co., Caracas and La Guaira, and Santana & Cia., Caracas.

DUTIES.

The tariff rates are varied, according to the class of such merchandise, and depend somewhat on whether they are manufactured of wood or iron or both.

Agricultural implements, in the strict sense of the word, are admitted free of duty—that is, such implements as plows, harrows, spades, hoes, rakes, etc., pay no duty on entering Venezuela.

Louis Goldschmidt, *Consul.*

La Guaira, Venezuela, *August 17, 1903.*

ASIA.

JAPAN.

(From United States Consul-General Bellows, Yokohama, Japan.)

HAND LABOR VS. MACHINERY.

The low price of labor in Japan precludes the use of labor-saving machinery except to a very limited extent. The equivalent of 25 cents American money would be a high price for a day's labor of a Japanese in any part of Japan, except in the treaty ports, where contact with foreign standards has affected the prices, and even in such places men may often be employed for less than that sum.

ROADS, ANIMALS, AND VEHICLES.

The country roads are usually too narrow to admit of the use of American styles of vehicles and in many places are too rough. Goods are carried on the backs of horses and oxen or in narrow two-wheeled carts. In the cities a few drays of the American style are used, and foreigners and the wealthier Japanese have victorias, landaus, broughams, phaetons, dogcarts, and American buggies.

IMPLEMENTS IN USE.

Very few modern agricultural implements are used, a few plows and one fanning mill being the only ones that have come under my observation. The fields are too small and all the operations on too diminutive a scale to be adapted to the use of machinery. An American thrashing machine would require two or three of these fields for standing room when in operation, and the ordinary waste of an American farmer, through inability to reach the edges and corners of his fields, amounts to more than the entire crop of many Japanese farmers. For preparing his ground the latter uses a kind of hoe (kuwa), which consists of a long, narrow, slightly curved iron plate, with a convenient handle. With this he turns over the soil quite rapidly to a depth of 8 or 10 inches. The seed is sown in rows, instead of broadcast, and is cultivated while growing by hoeing between the ranks, even wheat, barley, and similar grains being thus treated. It is harvested by cutting with a small hand sickle and thrashed by drawing it, a handful at a time, through a sort of hatchel, consisting of a frame furnished with close-set iron teeth, which strips the ears. The grain is then thrashed out with a flail and cleaned by pouring it from one basket to another in an open place on a breezy day, or by one person wielding a large fan while another pours it out. All the simple tools employed are made in

Japan and are better suited to their methods of farming than imported implements would be.

HOW TO INCREASE AMERICAN TRADE.

It may be seen from this description that little can be done to introduce American farm machinery into this country, though a good agent, accompanied by a capable interpreter, might be able to do something with the smaller implements, such as rakes, spades, shovels, scoops, etc., and with plows, fanning mills, potato diggers, and the simpler machines. In this connection I might note that 17,516,000 bushels of potatoes were exported from Japan last year. Such an agent should visit different sections and confine his efforts in any place to such articles as are suited or could be adapted to the needs of farmers in that vicinity.

IMPORTS AND TARIFF RATES.

The following table shows the value of the importations during 1902 of such articles in the list accompanying the Department circular as I find named in the trade returns of Japan; also the tariff rates imposed. Flour and cereal mill machinery is not named in the trade returns nor in the tariff schedule, but the newspapers report that it is used in increasing amounts and that the Japanese hope within a few years to manufacture all the flour used in the country.

Article.	Imports from United States.	Total imports.	Tariff.
			Per cent.
Implements and tools (farmers' and mechanics') and parts of	$39,812.61	$129,281.90	5
Gas engines	7,274.52	23,609.54	10
Lifting machines	16,782.68	159,227.96	10
Locomotive engines	283,497.16	852,590.99	10
Sawing-machine tools	3,799.08	24,007.47	10
Steam boilers and engines	223,543.90	450,815.82	10
Belting and hose for machinery	26,971.83	153,601.27	10
Fire engines and pumps	52,001.65	104,449.57	10
Pumps, machines, engines of all kinds, and parts thereof not otherwise provided for	....	....	10

DEALERS.

F. W. Horne, 70 Yamashita Cho, Yokohama, would be likely to be interested in promoting this business. The American Trading Company, 28 Settlement, Yokohama; Andrews & George, 242 Yamashita Cho, Yokohama; and W. S. Stone, 77 Yamashita Cho, Yokohama, also handle machinery.

E. C. BELLOWS,
Consul-General.

YOKOHAMA, JAPAN, *July 16, 1903.*

JAVA.

(From United States Consul Rairden, Batavia, Java.)

HAND LABOR VS. MACHINERY.

The cost of labor throughout Netherlands India is very small, being from 10 to 20 American cents per day, and this no doubt prevents the sale on any large scale of labor-saving machinery in the agricultural districts. Certain machines, however, are used for grinding sugar cane and for hulling coffee and rice, as the work can be done much quicker than by hand.

ROADS, ANIMALS, AND VEHICLES.

The roads throughout Java are fairly good and, together with the draft animal, are suitable for the use of all styles of vehicles, either for pleasure or freight.

IMPLEMENTS IN USE.

Few, if any, modern agricultural implements are used in Java for preparing the soil, sowing or planting seeds, cultivating during growth, or harvesting the crops. The old-style native-manufactured plow, costing perhaps $10, drawn by karbouw, is used for preparing the soil. Sowing and planting is done entirely by hand; also the cultivating and gathering of the crops. As already stated, the hulling of coffee and rice and grinding of sugar cane is done by machinery.

AMERICAN IMPLEMENTS.

Many American machines have been used in former years and are still used on coffee, rice, and sugar plantations and with good results. The Engelberg Huller Company, of Syracuse, N. Y., have supplied a large quantity of coffee and rice machines, and the Lidgerwood Manufacturing Company, of New York, formerly did a large business in sugar machinery in Java.

Coffee and rice machines of American manufacture are sold throughout Java, and formerly a very good business was done in these articles. American sugar machinery is sold largely in East Java, which is the principal sugar district.

These American machines have been, and still are, considered among the best in the market, but as the European-manufactured machines are sold much cheaper at the present time business in American machinery has fallen off considerably. If our manufacturers could see their way to reduce the prices of their machinery, I know of no reason why the business in this article can not be increased.

American vehicles are sold here, but the public in general does not care for them; consequently, a very small business is done in this article. American wagons are not sold in Java.

HOW TO INCREASE AMERICAN TRADE.

A reduction in prices of American machinery would, no doubt, be the means of increasing the trade in this part of the East.

Among the goods mentioned in the list of articles manufactured by the association, the following would sell well in this consular district: Axles for wagons and carriages; carriages, if style made suits the public; fencing wire; hardware; harness; lawn mowers; and vehicles and bicycles.

DEALERS.

The firm of Taylor & Lawson, Batavia, might be induced to take up the business in American machinery, and the firm of the Ruytig Maatschappij Fuchs (the principal carriage dealers in Batavia) sell American vehicles and would no doubt be glad to increase their trade in this article.

DUTIES.

Customs tariff in the Netherlands India is 6 per cent ad valorem on vehicles, including bicycles and automobiles, while machinery is free.

B. S. RAIRDEN, *Consul.*

BATAVIA, JAVA, *August 4, 1903.*

SIAM.

(From United States Consul-General Nash, Bangkok, Siam.)

HAND LABOR VS. MACHINERY.

The cost of hand labor is too small to justify the use of labor-saving devices in agriculture. In manufactures, however, the prospects are brighter.

ROADS, ANIMALS, AND VEHICLES.

Outside the city of Bangkok there are no roads upon which American vehicles could be used. Transportation is almost entirely by water and by rough bullock-cart trail through the jungle. In Bangkok the roads are excellent and light victorias and dogcarts are used extensively. I think the runabout could be introduced. The native horses are from 10 to 12 hands high and there are a very few Australians of 13 to 15.5 hands high. In the agricultural districts the bullock (10 to 12 hands high) is the only draft animal.

IMPLEMENTS IN USE.

Modern agricultural implements are not used; the nature of the soil—a soft mud—makes their use, as they are now manufactured, impracticable if not impossible. If a plow sufficiently light could be devised, it could be used here in the rice fields.

AMERICAN IMPLEMENTS.

No American agricultural implements are sold here for the reason stated above, and the vehicles are manufactured here or imported from Saigon and Singapore.

HOW TO INCREASE AMERICAN TRADE.

If an agent were in this part of the world, I should suggest his visiting Bangkok. I do not think the prospects sufficiently bright, however, to warrant sending one from the United States expressly for this market.

From the list inclosed in the Department circular, I have chosen the following articles as being most likely to find a ready sale in Siam:

Automobiles.
Boiler fronts and castings.
Brass goods.
Belting.
Carriages.
Castings, malleable and gray iron.
Dump carts.
Engines.
Hardware.
Harness.
Locomotives.
Grinding mills.
Mill supplies.
Sawmills.
Cane mills.
Refrigerating machinery.
Shovels.
Spades.
Scoops.
Sickles.
Steel tanks.
Umbrellas.
Windmills.
Wagons.
Carriage wheels.
Wheelbarrows.
Well-drilling machines.

I would suggest, in connection with this report, a careful study of the report by the Hon. Hamilton King, dated December 12, 1901, entitled "How to win trade in Siam."*

DEALERS.

Harry A. Badman & Co., Kiam Hoa Heng & Co., Charles Kinder, Falck & Beidek, Clarke & Co., E. Fornoni, and the Borneo Company (Limited), firms handling the line of goods mentioned, are all well spoken of.

The tariff rate is 3 per cent on all goods of this class.

PAUL NASH, *Consul-General.*

BANGKOK, SIAM, *July 11, 1903.*

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* See Commercial Relations for 1902, Vol. I, page 1091.

SYRIA.

(From United States Consul Ravndal, Beirut, Syria.)

HAND LABOR VS. MACHINERY.

Owing largely to emigration to North and South America, wages in this country have been growing at such a rate that it is no exaggeration to declare an increase of 40 to 50 per cent during the last fifteen years. Wages are still low, the unskilled laborer receiving an average wage of 25 cents a day. I have no doubt, however, that the age of machinery is dawning upon this country.

IMPLEMENTS IN USE.

Agriculture is the main industry of Syria, but it is in an extremely backward state, the implements commonly in use being the same as those in vogue in the ante-Christian era. Large tracts of land of great fertility lie waste and depopulated, though showing traces of former prosperity and teeming populations. Agricultural and irrigation machinery and railroads will prove strong factors in the redemption of these regions. In the plains of Sharon, Esdraelon, Hauran, Bekaa, etc., modern agricultural machinery has begun to appear, and I am glad to report that most of it is of American make.

American plows and reapers were operated in the Haifa neighborhood (upper Sharon) under the auspices of the American and German members of the "Temple Colony." In the Bekaa (Coele-Syria) a Jesuit missionary organization conducted a "model farm," on which was employed a limited variety of French machinery. In certain Jewish colonies modern machinery was experimented with, but as they were subsidized by foreign capitalists work was largely perfunctory.

It was not till last year (1902) that natives of Syria and Palestine began using machinery in tilling the soil and in harvesting the crops. From now on the use of agricultural machinery and modern implements will grow steadily here, and there seems to be no reason to doubt that American manufacturers will control the market.

I do not believe there are more than 75 modern reaping machines (including perhaps 20 self-binders) in this district, which comprises nearly all of Syria and two-thirds of Palestine. There are some 12 up-to-date windmills, 4 or 5 gristmills, 40 olive-oil presses, 25 petroleum engines, 2 steam thrashing machines, 1 well-drilling machine, 3 hydraulic rams, 175 silk-reeling factories, one-half dozen licorice-root and tobacco presses, etc. Reapers, thrashing machines, gristmills, and wind engines came from the United States. France furnishes silk-reeling machinery and some olive presses. Such presses also come from England, which country competes with Germany in the matter of oil engines. I have agitated the introduction of American oil engines, and a few specimens have been brought in. They do not seem to do well with Russian oil. American petroleum, which used to be in exclusive command of this market, is not sold here any more, nor is gasoline for sale in this country. I have also endeavored to introduce American olive-oil presses. Those in use are hydraulic presses, ranging in capacity from 56 to 120 tons, with cylinders of 5 to 8 inches, respectively, and selling for $350 to $700. In constructing and selling such hydraulic presses in this market the following items should be considered:

1. Perfect castings, so as to overcome leakage and breakage to the greatest degree.
2. All presses should be provided with safety valves and pressure gauges. In the hands of ignorant workmen many presses are disabled.
3. Detailed instructions should be sent along with the machine, even including advice which would be superfluous and needless in the case of an American or European workman.
4. Naturally, it is essential that the price of the machine as delivered in Beirut should compare favorably with that of English and French machines of equal capacity.

HOW TO ENLARGE AMERICAN TRADE.

In my reports to the Department of State entitled "American machinery in Syria" and "American agencies in Syria," published in CONSULAR REPORTS Nos. 269 and 272 for February and May, 1903, respectively, I suggested the most effective means of introducing and increasing in Syria and Palestine the trade in agricultural machinery and implements. Samples should be forwarded, as far as possible, and correspondence should be addressed to the following firms: Michel J. Nasser, Beirut, Syria; American Exchange Co., Haifa, Syria; and Meshaka & Nachman, Damascus, Syria.

Difficulties are experienced here in repairing machinery and securing proper draft animals for heavy work, but these will gradually be eliminated.

For at least eight years to come agricultural machinery and implements will be admitted to Syria free of duty.

Specimens of American cultivators, cornshellers, hayrakes, harrows, mowers, fanning mills, pumps, plows, rollers, and well-drilling machines have appeared in this market, and a fair trade in these articles is sure to grow up. Other American manufactures which would be well received here, if properly introduced, are fencing wire, road machines, refrigerator machinery, garden clippers (for use in the mulberry groves in the silk season), sickles, and wagon umbrellas.

I have personally had considerable to do with organizing things so as to open a way into this country for modern machinery, and have attended the first experiments with our reapers, gristmills, windmills, and thrashing machines. Last year witnessed the arrival of the first steam thrashing machine ever seen in this country. It was installed in Cœle-Syria, where it created a tremendous sensation. Hitherto all grain has been separated by oxen treading it out or drawing a slab with teeth underneath around the thrashing floor. It is a method which renders the grain dirty and causes much waste, besides being extremely laborious. A few days ago the second steam thrashing outfit (like its predecessor, made in Richmond, Ind.) was started on its career of highly important pioneer work in the territory around Damascus, in the presence of many pashas and of the highest officials of the Province, including Nazim Pasha, the governor-general. I was unavoidably absent, but received full information and photographs of the ceremony. Through Damascus the traction engine pulled its train, acclaimed by multitudes such as are never seen in that city except on the day when the annual pilgrimage starts for Mecca. South of Damascus lies the Hauran, the granary of Syria. I consider the introduction of this one outfit as foreshadowing a complete revolution in the economical conditions of that region.

ROADS, MINERALS, AND VEHICLES.

As to vehicles, it is to be observed that camels and donkeys are largely used for traveling and transportation purposes, reducing materially the number of carts, carriages, wagons, etc., required. All the Hauran grain is carried on camel back to the sea. I have met hundreds of camels in a string, silently passing the traveler in the night (July and August) on their way through Capernaum to the Mediterranean. Between Damascus and Beirut freight wagons, drawn by mules, are competing with the railroad. In Beirut drays and trucks are used to convey freight from the custom-house to merchants and to the railroad depot. But, generally speaking, carts, wagons, drays, trucks, etc., are not employed largely in Syria and Palestine. On the farms a wagon of any description is hardly ever seen. Grain is brought in on the backs of camels and donkeys. Delivery wagons are unknown in Syrian cities.

In the absence of street cars and owing to the scarcity of railroads, foreigners residing here and tourists have called into existence a great number of carriages (victorias), of which there are 500 licensed in Beirut and that many more throughout the Lebanon, where good carriage roads now exist.

At Haifa tourists on their way to Nazareth and Tiberias or to Jerusalem are largely served by two-seated surreys, made in Buffalo, N. Y., especially for the rough roads of Galilee.

I have advocated the introduction here of American carriage springs, and small sample orders have been filled, giving promise of additional business. American axles, wheels, and horseshoes may find a receptive market here. We have recently introduced some buggies, road wagons, and phaetons from America, but it is too early to speak of their reception in these markets. American harness and saddlery are for sale in Haifa and are growing in popularity.

An American automobile is expected out here next winter. It will be the first of its kind in Syria and Palestine, excepting a second-hand French machine which appeared some years ago and broke down on its first outing on the Damascus road.

DUTY.

In Turkey there is a duty of 8 per cent ad valorem on articles of this kind.

DEALERS.

American exporters of vehicles may find it to their advantage to correspond with Antoine Dommar, Beirut, Syria.

G. BIE RAVNDAL, *Consul.*

BEIRUT, SYRIA, *July 27, 1903.*

AFRICA.

ALGERIA.

(From United States Consul Kidder, Algiers, Algeria.)

HAND LABOR VS. MACHINERY.

Although the cost of hand labor is much less than in the United States, agricultural labor-saving machinery is used to a considerable extent.

ROADS, DRAFT ANIMALS, AND VEHICLES.

The roads are excellent and the draft animals are the same as in the United States—horses and mules—but the ordinary American styles of vehicles for pleasure or freight are not adapted to this country. This is due to the fact that Algeria is very mountainous, and the heaviest and strongest of brakes or drags are required on all vehicles. No vehicles whatever are used without brakes. The largest wagons, called chariots, used in Algeria are for the transportation of hogsheads of wine from the interior to the seaboard and are built with special reference to their requirements.

AGRICULTURAL IMPLEMENTS IN USE.

Modern agricultural implements are used for the same purposes as in the United States, but to a less extent, owing to cheaper hand labor. The mowers, reapers, and binders used are principally made in the United States, as are also some of the plows. Thrashing machines and smaller implements and hand tools are made in France and England.

AMERICAN IMPLEMENTS IN USE.

As stated above, American implements are sold in Algeria, but vehicles and wagons are not, and are not likely to be unless some manufacturer comes here and studies the situation and makes an article to meet the demand.

The American harvesting machinery in use here is popular and holds the market in preference to any other kind, but it is doubtful if the amount annually imported could be increased at present, for the simple reason that there is no annual increase in the acreage devoted to the cultivation of cereals. The official reports show that the acreage planted in grain in 1900 was slightly less than in 1890, the average area for the above decade being 6,274,800 acres, producing 1,572,100 metric tons annually.

Custom-house statistics as to the amount of American implements imported into Algeria are very misleading. For the year ended December 31, 1901, 272 tons of entire machines (Appareils complets paur l'agriculture) are reported as coming direct from the United States. This is rather vague as to the number of machines or as to the kind. No mention whatever is made as to implements sent by way of entrepôt in France; whereas, with the exception of some of the larger machines such as mowers and reapers, everything comes through France, where the statistics are taken on arrival.

HOW TO INCREASE AMERICAN TRADE.

The best method of introducing or increasing the trade in implements is by the direct representation of a competent agent, with the goods to show and explain. No other method can give equal results. Algerian business houses will not go to the trouble to introduce foreign goods so long as they can make the same profit on inferior domestic articles. American plows were formerly sold here in greater numbers than at present. They are now imitated very closely as to the shares by French manufacturers, by whom iron or steel shafts or tongues are substituted for the American wood and exploited as being better than the American article.

A careful investigation shows that business might be done in baling presses, manure spreaders, potato diggers, plows, and harrows. A good crusher for grain for feeding live stock is wanted. Such windmills as are used are of American make, but are much less used than one would think desirable from seeing the old-fashioned bucket pumps operated by horse or mule power in almost every field.

DEALERS.

The leading houses dealing in agricultural implements are as follows:

Billiard et Cuzin, and Caillat et Euziere, Mustapha, Algiers.
Lavillat, and F. Reynaud, Rue Nationale, Constantine, Algeria.
Lhermine, Boulevard Séguin, Oran, Algeria.

DUTIES.

Tariff rates on agricultural implements imported into Algeria are the same as those which prevail in France, namely, 15 francs ($2.90) per 100 kilograms (220 pounds).

DANIEL S. KIDDER, *Consul.*

ALGIERS, ALGERIA, *June 10, 1903.*

EGYPT.

(From United States Consul-General Long, Cairo, Egypt.)

HAND LABOR VS. MACHINERY.

The cost of hand labor in Egypt is not sufficiently great to justify an extensive use of labor-saving machinery by the agricultural interests.

ROADS, ANIMALS, AND VEHICLES.

The roads and draft animals are hardly suitable for the use of American styles of vehicles, camels and donkeys being used to a very great extent for carrying burdens and for riding purposes. Oxen are used in plowing. Small carts are, however, used in the large cities.

AGRICULTURAL IMPLEMENTS IN USE.

Modern agricultural implements are used to a very small extent in preparing the soil, sowing the seed, and cultivating or harvesting the crops. American agricultural implements are sold in this district and are popular where used. The trade can undoubtedly be increased. They sometimes require adaptation to the soil of this country.

HOW TO INCREASE AMERICAN TRADE.

Samples of the articles used on large farms in the way of demonstration would undoubtedly be the most effective means of introducing and increasing the trade.

From the list annexed to the Department's circular I would designate the following as selling most readily in Egypt:

Autos.
Carriages.
Engines.
Fencing wire.
Flour-mill machinery.
Gasoline engines and pumps.
Grain sieves.
Hardware.
Harness for carriage horses in cities and horseshoes for same.
Wood and iron pumps.
Walking plows with one handle.
Plumbing supplies.
Shovels and spades.
Steel tanks.
Sun umbrellas.
Windmills.
Windmill towers and pumps.
Windmill tanks and regulators.
Well-drilling machines and tools.

DEALERS.

Messrs. Allen, Alderson & Co., A. Aboaf & Co., Bretschneider & Co., J. Gerard, A. Joubert, A. Koppel, Kortenhaus & Hammerstein, Alb. Korschel, R. Kuster & Co., H. Laroussie, A. E. Nasra, Orienstein & Koppel, E. Kirby, and N. Sarruf deal in or are agents for agricultural implements and industrial machinery in Cairo, Egypt. The Messrs. Allen, Alderson & Co. have a branch in Alexandria and have done a great deal for the introduction of American agricultural machinery.

DUTIES.

The tariff rate imposed on imports into Egypt is 8 per cent.

John G. Long,
Agent and Consul-General.

Cairo, Egypt, *June 22, 1903.*

MOZAMBIQUE.

(From United States Consul Hollis, Lourenço Marquez, Portuguese Africa.)

PRODUCTS OF THE PROVINCE.

The agricultural interests in the Province of Mozambique are at present in a state of transition, caused by the new conditions brought about by the late war.

A few years ago the staple agricultural products were (*a*) peanuts and other oil seeds, which were raised for the European market; (*b*) cane products, principally rum, which were produced for the Transvaal trade; and (*c*) white corn, which was raised all over the Province for home consumption as well as for export to the Transvaal.

Now the peanut and oil-seed trade is about the same as it used to be, only large quantities of peanuts are being shipped to the Transvaal, where they are eaten by the Mozambique contract laborers in the mines.

The trade in cane products has undergone a radical change. Formerly, large quantities of Mozambique and Zambezi rum were exported to the Transvaal for the black native trade, but now this traffic has been abolished and the cane growers must produce sugar instead of rum.

The sugar business should become a very profitable one in this Province, as Mozambique sugars can enter the Transvaal free of duty while all foreign sugars are taxed.

There is also a considerable demand among the black laborers in the Transvaal for ripe sugar cane for eating, and considerable quantities are now being shipped to Johannesburg and other mining towns.

The demand for white corn in the Transvaal is now very great, and as Mozambique corn can be imported into the Transvaal free of duty, while corn from other countries is taxed, the cultivation of corn in this Province is becoming a very important industry.

IMPLEMENTS IN USE.

In the raising of these three staple articles already mentioned, modern agricultural implements are only used on the plantations of white people. The Kaffirs on their own farms and garden patches use only the crudest implements, such as hoes fitted with handles cut from the nearest bush, and these, together with crude machetes and axes, constitute their sole agricultural implements.

Agricultural hand labor, especially that of women, is very cheap here.

On the large farms and plantations, owned by white men or by companies and syndicates, more modern ideas prevail and first-class tools and implements are beginning to be used to a considerable extent.

In the harvesting of corn, American cornshellers are largely used.

ROADS, ANIMALS, AND VEHICLES.

The transportation of these Mozambique agricultural products from the farms to the towns is generally effected by native porters, by river boats, and by small steam craft, though the large ocean steamers that trade along this coast are now doing quite a business bringing corn, etc., from the northern ports to this port.

There are very few roads in this Province suitable for draft animals or for American styles of vehicles. Very few vehicles are imported at this port for local use, and those that are imported are generally secondhand colonial-made affairs. Draft animals are subject to innumerable sudden and fatal sicknesses and on this account traction engines of English manufacture are being gradually introduced here.

HOW TO INCREASE AMERICAN TRADE.

Considerable quantities of American agricultural implements, tools, etc., can undoubtedly be sold in this Province, but they must first be introduced by traveling representatives of the manufacturers. Once introduced, judicious advertising and letter writing will serve to keep the trade in a healthy condition. There are no artificial obstacles to the extension of the trade in these lines of goods in this Province, as all such goods are admitted free of duty.

DEALERS.

In this port one firm—that of Messrs. Allen, Wack & Co.—has practically a monopoly of this class of trade, and I have, during the past year, put this house in communication with quite a number of American manufacturers of agricultural machinery, implements, etc., and I am confident that some very satisfactory business arrangements will result from my efforts in this line. The only other houses in this Province that I know of as likely to handle goods of this sort are: J. D. Martini, the Manica Trading Company, and Suter & Co., all of Beira, and the African Lakes Corporation, of Chinde, Zambezia.

W. Stanley Hollis, *Consul.*

Lourenço Marquez, Africa, *July 28, 1903.*

TRANSVAAL.

(From United States Consul Proffit, Pretoria, Transvaal.)

In preparing the following report, I have availed myself of every possible opportunity to gain from the farmer and the dealer in agricultural implements and vehicles such information and advice as I deemed valuable in the furtherance of American trade in the articles mentioned.

HAND LABOR VS. MACHINERY.

The black man is largely employed for all the rougher classes of labor, both in the agricultural and mining communities, his wages, in round figures, being 50 cents per day in addition to his keep. The white man, when employed on the farm or as helper to the artisan, or in any work requiring a somewhat higher degree of skill and judgment than is expected of the black, receives from $2 to $2.50 per day. This wage is slightly increased during harvest. It will thus be seen that any device for labor saving should be of easy introduction.

ROADS, ANIMALS, AND VEHICLES.

The Transvaal is a very rugged country, the roads in most localities being steep and heavy in both dry and wet seasons. The animals used for draft purposes are donkeys, mules, and oxen. The word "span" has become a misnomer in the Transvaal, for here a span of oxen may mean anywhere from ten to sixteen head, and the farmer who carries his produce to market must first make an outlay for draft animals of from $1,000 to $1,200. The wagons used are very heavy and must be capable of bearing a weight of from 8,000 to 10,000 pounds. These wagons are manufactured in the towns of Natal and Cape Colony, the material being in most part imported from the United States.

For pleasure, the animal is the horse and the vehicle ordinarily the Cape cart, a heavy, two-wheeled affair with a top of thick canvas. To this cart two horses are driven. These carts are made in Cape Colony, hence the name. In some of the more level localities buggies and spiders are used. It should be borne in mind that a buggy is invariably known here as a light, two-wheeled vehicle with a leather or oilcloth top. The spider is a four-wheeled vehicle resembling the American top buggy. American manufacturers have catered to this trade and would be able to capture and hold the major portion of it if they would but heed the oft-repeated request of the Transvaal dealer to the effect that the running gear be made stronger. American styles are preferred, but much of the trade is going to England because American manufacturers have lulled themselves into the belief that a vehicle suitable for American roads is good enough for the Transvaal. In the rainy season the roads are much broken by gullies and ravines, and a vehicle is required which will stand the constant strain caused thereby.

IMPLEMENTS IN USE.

Modern agricultural implements are used in preparing the soil, sowing and planting the seed, cultivating during growth, and harvesting the crops.

AMERICAN IMPLEMENTS.

American implements will perhaps maintain the lead. The methods now being pursued by the American implement manufacturer are effective in keeping our goods before the South African public, and it is a fair assumption that the trade in this line will increase with the wants of the country. Although our vehicles and wagons have enjoyed a fair share of the trade, this trade will decrease unless our manufacturers heed my suggestion relative to building a stronger and heavier article. The Transvaal customer pays, perhaps, the highest price in the world, and his wishes should receive consideration. Straw being a valuable article of feed in South Africa, a thrasher is required which will, in addition to cutting the straw into small pieces of from three-fourths of an inch to 1 inch in length, bruise the same. The English machines are so built and are therefore used almost exclusively.

I recently visited a large Government farm in the Heidelberg district, upon which many Boers, whose homes had been destroyed during the war, were being repatriated. Farming operations were beginning on a large scale and an entirely new supply of farming implements had been purchased, and of these the American makes largely predominated. A few German and English plows were seen, but those of American manufacture had been given the preference. The hayrake was but recently introduced, but is growing in popularity. Our mowers have come to stay and meet with little, if any, competition. This farm may be considered fairly representative of the kinds of implements employed on the farms of this colony.

HOW TO INCREASE AMERICAN TRADE.

The American manufacturer should select responsible firms in the various localities, to which samples of his wares should be sent on consignment, the matter of payment being held in abeyance until sales are made. The introduction of a new article necessarily requires time. South Africa is a large country, the means of communication between different points slower and more difficult than in the United States, and traveling salesmen are therefore not a feasible agency in many instances. Catalogues are apt to find their way to the wastebasket or, if preserved, will not be understood in many instances, as the Dutch language prevails in the rural districts. The surer and better method is to bring the article before the prospective customer's eye, and to have its merits explained to him by men with whom he is familiar and in whom he has confidence. Then there is the question of credit—a question upon which the American manufacturer has always taken a decidedly negative stand, as far as South Africa is concerned. South Africa, after all, is not many days from our shores, the means of communication are reasonably quick, the bankruptcy laws are more favorable to the creditor than in the United States, and the same commercial agencies which the manufacturer would employ to report the financial condition of slow debtors in the United States have offices in South Africa. Germany, by extending a liberal credit, is rapidly increasing her trade along certain lines and thus offers an example which the American manufacturer could emulate to the advantage of American trade.

DEALERS.

Following is a list of the more prominent houses dealing in the goods mentioned:

T. W. Beckett & Co., Johannesburg.
Sommers & Co., Rustenburg.
Kelly & Co., Pietersburg.
Paddon & Co., Standerton.
Izaak Haarhoff & Co., Pretoria.
Sherriff Swingley & Co. (mining), Johannesburg.
Fraser & Chalmers (mining), Johannesburg.
Johnson & Weeks (mining), Johannesburg.

DUTIES.

Specific duties.

Carriages, carts, coaches, wagons, and all other wheeled vehicles, including finished parts thereof, not being metal parts usually made in Africa, but required in the manufacture of wheeled vehicles therein, per $486.65 in value, $60.82.

Ad valorem duties.

The following are subject to a duty of 2½ per cent ad valorem:

Machinery not elsewhere described, to be driven by cattle or electric, gas, heat, hydraulic, pneumatic, steam, water, or wind power, including spare parts; and apparatus and appliances used in connection with the generating and storing of electric power or gas, electric cable or wire, and the posts for carrying the same.

Locomotives and all railway-construction equipment requisites.

Traction engines and power lorries.

Duty free.

Agricultural implements and machinery, and all apparatus and plant usually and principally employed in farming operations; binding twine and harvest yarn.

COMPLAINTS CONCERNING AMERICAN BOILERS AND ENGINES.

It is with no pleasure that I report the fact that frequent complaints are received at this consulate from the importers of our goods, and it would perhaps interest the Association of Implement and Vehicle Manufacturers to know that these complaints are confined almost entirely to the classes of wares which they manufacture. The importers complain that American goods, especially in the machinery line, do not meet representations. Nine new boilers of American make, invoiced at about $30,000, were recently condemned and thrown out on the veldt near Johannesburg as absolutely worthless. A lawsuit grew out of the transaction, and the newspapers gave wide publicity to the fact. The electrical, mining, and mechanical engineers on the Witwatersrand gold fields are, for the most part, Americans, and through them our manufacturers have built up a large trade, especially in boilers and engines; but instances like the above create a detrimental prejudice not only against the article condemned, but against American goods in general.

The Transvaal boiler regulations are herewith inclosed, a careful reading of which is recommended to the association.*

A letter of complaint from one of the largest dealers in electrical supplies in this city has been received since this report has been in progress. Omitting the name of the manufacturer of the article complained of, a copy of the letter is inclosed herewith.

In conclusion it is only necessary to say that practically all articles enumerated by the Department circular will find a sale in this colony.

JOSEPH E. PROFFIT, *Consul.*

PRETORIA, TRANSVAAL, *August 10, 1903.*

[Inclosure in Consul Proffit's report.]

SIR: About the end of last year we imported a steam plow from ———. We now find that the inspector of machinery will not allow us to use the steam pressure necessary for using this plow because the boiler is not good enough. He says in the Inspection Register: "Internally, condition good; but not of high class manufacture and light construction."

We may add that the working pressure of this boiler should be 140 pounds to the square inch, and we are only allowed to use 110 pounds. Under these circumstances, it is rather doubtful whether we shall be able to get any work done by this plant. You will therefore understand that it will be impossible for us to import any more of these plows, which is a great pity, as they are very useful in this country. Knowing that you take a great interest in matters of commerce concerning your country, we should be greatly obliged if you would kindly bring the above to the notice of the manufacturers, as we suppose that it will be to their own interest to make something that is more fit for export, if they receive a warning from you.

We remain, etc.

PRETORIA, TRANSVAAL, *July 31, 1903.*

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* Boiler regulations on file in Bureau of Statistics.

AGRICULTURAL IMPLEMENTS FOR SOUTH AFRICA.

(*From the British South African Gazette of July, August, and September, 1903.*)

AGRICULTURAL CONDITIONS IN SOUTH AFRICA.

The tillage of the soil in South Africa presents features common to agriculture all the world over, in addition to others peculiar to itself. Of these latter, two of the leading are insufficiency of labor, chiefly native, and a deficient supply of rain in the wet season, necessitating extreme dispatch in sowing and harvesting operations. These two factors make for the use of mechanical appliances in all departments of farming in a high degree, and this tendency has been accentuated in recent years by the reduction of draft animals, caused by rinderpest, horse sickness, and the waste of cattle resulting from the war. Peculiarities incident to variety of soils are, perhaps, to be taken among the ordinary contingencies attaching to every locality and country; but the fact that South Africa embraces a multiplicy of climates, from subtropical to temperate, and that the heat of the sun either pulverizes the soil into sand or bakes it to the solidity of stone, makes the catering for its requirements a matter of less ease than that of many other countries situated in more temperate or damper regions. Other peculiarities are the relative sparseness of the agricultural population, the unmanageable extent of the farms, and, in many cases, the retrogressiveness and limited resources of the farmers as a body. These peculiarities are, however, by no means beyond the powers of manufacturers to overcome, who now recognize that South Africa is beyond question a splendid field for the display of the advantages of good farm machinery and practically a virgin country for exploitation. Moreover, the best sense of the South African community, and in particular the agricultural departments of the various colonies, are now directing unremitting attention to the improvement of husbandry, vine dressing, and fruit culture by introducing steam-driven plows, diggers, mowers, thrashing machinery, grain shellers, huskers, and grinding mills—in short, all kinds of mechanical implements and appliances; while the attention of farmers is constantly being called to their utility by experimental demonstrations of their use. The utility of steam plows and other mechanical and automatic farming machinery, first recognized and given effect to by the engineers of Great Britain in the middle of the last century, is thus now, late in the day, penetrating to South Africa, and is leading to the slow but gradual displacement of the Abrahamically primitive implements there in use, such as the antiquated "75" single-furrow plow and the old triangular Dutch harrow. It will, therefore, not be without interest and value if we set before our colonial readers—whether importers or actual users—a display of the latest products of engineering skill in order to inform and guide them in the selection of the most modern types of agricultural appliances now in vogue in more progressive countries. With this intention, we shall describe in the following and subsequent articles the peculiarities and advantages of the steam plowing and other machinery of some of our leading manufacturers.

I.—STEAM PLOWS.

Steam plows of varied construction for deep furrowing or simply loosening the soil were first shown in 1851, and from that time on their use has steadily spread throughout the British Isles, on the Continent, and in the western and southern hemispheres. As may be supposed, these and similar appliances were at the first, to a certain extent, few in number and rudimentary in design compared with those of later times. Improvements have, however, been constantly effected, the result of experience, experiment, observation, and suggestion, so that now mechanically driven farming machinery is built to answer any and every requirement either relating to character of soil, lay of ground, depth of tilth, or peculiarity of crops to be grown. Although relatively costly compared with ordinary plows, those driven by steam in the long run soon show surprising economies over animal traction, while the enhanced yield and superiority of crops are such that farmers who have once had resort to them never willingly return to the old system. Where the smallness of the means of agriculturists has been found to offer insuperable bars to the adoption of steam plows, cooperative farming, or the loan of engine and tackle by private firms, has found a full solution to the difficulty.

The double-engine system.—Plowing by means of engines is now conducted on three separate systems, viz, the "double-engine" system, the single "double-drum-engine" system, and the "roundabout" system, the latter working with the last-named type of engine, a portable windlass, and two automatic self-moving anchors traveling in two opposite headlands of the field. There is also another steam system using an appliance called a digger, which will be subsequently described. The double-engine system consists of two engines working parallel up and down opposite sides of a field and alternately, drawing the powerful plow backward and forward. It is simplicity itself, comprising merely two specially constructed engines, hauling tackle, and specially constructed plows. Although this system involves the cost of two engines, it saves on the one-engine system by doing away with other fixtures, such as windlasses, movable plows, etc., and, moreover, is capable of working the most powerful plows over the sandiest or roughest land, and to the greatest depth, without difficulty. For light land, of which there is so much in South Africa, this system is especially suitable, as it allows of the use of implements of the greatest breadth, which are known to give the most economical results upon such soil. Besides, when not in use for plowing, the dual engines may be made serviceable for supplementary farm work, as cultivating, harrowing, rolling, draining, drilling, etc., removing rocks and roots from the land, transporting produce and goods, etc.

The single double-drum engine.—The single double-drum-engine system is so called from the engine being fitted with a special drum whereon the plowing tackle revolves. In working, the engine requires to be placed at one corner of the field to be tilled, at the opposite side of which is a self-moving anchor, with corner anchors at the other corners of the field. The plow is drawn from one side of the field to the other by the power exerted from the engine through some 1,300 yards of steel rope working through the anchors, snatch blocks, and over the wire porters. The engines in the several systems are specially strengthened to support the drums, which in each case are removable when the engine is required for other work. The patent automatic self-moving anchor is a special creation, designed to move automatically along the headland each time the plow comes to the anchor at the completion of the furrow. This operation is under the control of the plowman, who, without leaving his plow, can arrange the distance of the forward movement or steer the anchor round a crooked headland.

The roundabout.—The third, or "roundabout" tackle, system requires only an ordinary portable or traction engine, a patent double-drum windlass mounted on four wheels, two self-moving anchors of the type previously described, two claw anchors, a snatch block, and two wire porters. The engine and windlass are placed side by side at the bottom of the field, and the two anchors, placed parallel, work the plow in furrows in a direction away from the engine. This system is cheaper than the two former, but its execution is less. The improved patent compound and single-cylinder engines are all fitted with drums, some being vertical and others horizontal; they are replete with many improvements to facilitate their special work and some are constructed to burn straw, stubble, and other waste as fuel. The plows, cultivators, diggers, grubbers, and ditching and draining machines for use with these engines are very substantially built and of design suitable for the most varied soils and purposes, including, besides the various cereals, vegetables, vine dressing, and fruit culture. This system has already been adopted in South Africa, the De Beers Company having imported a number of sets, and several have been supplied to the New Jagersfontein and Koffyfontein Mining companies in the Orange River Colony. In the Transvaal, Messrs. Lewis and Marks successfully introduced the system on their Vereeniging estates in 1898, working an eight-furrow patent turn-round plow, cultivator, and digger. Quite recently a set has been shipped to the order of the South African Farms (Limited), for use on their Marvelsspan, Fort Kepdam, and Turl farms, and a complete set is now on order for the agricultural department at Pretoria. Among other specially useful appliances for South Africa are the patent excavating scoop dredgers and pond cleaners, invaluable for keeping in excellent condition the necessary homestead dams.

II.—MOTOR PLOWS.

The perfecting of the motor for the purposes of transport has naturally involved its utilization in farming operations and the placing on the market of an appliance which is an effective substitute for animal draft.

The "Ivel" is of much lighter build than a traction engine, despite which it is capable of moving the heaviest types of agricultural machinery or of drawing goods-laden wagons along a road. It may be likewise used alternately for all the purposes served by a stationary engine—for working chaff cutters, thrashing machines, root pulpers, grinding mills, etc. It requires the attention of one man only for the purpose of steering it. Its motive power is supplied by a 10-horsepower-governed double-cylinder petrol motor, a friction clutch being used to transmit the power. It has one speed and a reverse, the former regulated by a lever, and is fitted with two band brakes to the road wheels, which last have extra wide rims, with grips for preventing skidding or slipping on wet ground. The machine weighs only 28 cwts. (3,136 pounds), and the weight, being distributed over three wide wheels, makes hardly any impression on the land. Plowing tests made show that 2 acres 15 poles of land with a very bad surface were plowed to an average depth of 7 inches in five hours and forty minutes, at an expenditure of 7¾ gallons of petrol and 2½ pints of lubricating oil. A modified form has been designed for use in vineyards. Although only now making its initial entry, it is obvious that this class of motor has a future before it, and especially in South Africa, where its relatively moderate cost should insure attention being given to it.

Another firm is engaged in adapting the motor to farming operations. The petrol-motor plows range from 8-b. horsepower to 20-b. horsepower and are fitted to one, two, three, and four furrow plows. It is calculated that one of these machines can do the plowing, sowing, etc., of 6 acres of ground in a day at a cost of 4s. (96 cents) per acre, as contrasted with the 1-acre day's work of two horses and a plow at a cost of 10s. ($2.43) per acre. By means of attachments the motor can also be made to serve seeders, mowers, reapers, binders, and thrashers. It is likewise capable of having a plowing attachment fastened to it, in addition to which it may be utilized as a tractor or road vehicle, or as a farm stationary engine. The diverse adaptabilities of these motors and their moderate price should indeed render them very acceptable in many districts of South Africa, where the laying down of costly plants is beyond the means of the average farmer.

III.—STEAM DIGGERS.

Among appliances to which the colonial agriculturist in search of powerful auxiliaries to his labors will turn with considerable interest is the land digger, a machine which is only now making its entry into South Africa. It is true that demonstrations of its capabilities have recently been made before the Potchefstroom and Klerksdorp Farmers' Association, and some outfits have been sold in the Cape Colony, and curiosity on its account has been generally called forth; but, apart from these instances, the appliance is practically unknown. For the hard, dry soil of the majority of South African farming districts it would seem the "Darby" digger possesses special fitness, and all that is required is for it to become better known. The main lines of the machine may be shortly described as a triangular framework, equipped with horizontal disks on vertical supports, running on a single wheel, and coupleable to any ordinary traction engine. In detail, the triangular framework is equipped on each of its two outer sides with five upright revolving shafts, each shaft being formed into a forked head, in which are fitted tapering stems, having at their lower ends steel circular-shaped disks riveted onto the stems. Each stem revolves on its own axis, and each pair of disks revolves around an axis common to the pair. The result of this arrangement is that the revolving disks, which are the shares or digging tools, describe continually overlapping courses over the ground as the digger is drawn along, cutting up and pulverizing the soil to depths of from 2 to 11 inches, according to requirements, in a way effected by no other tool. The breadth of the machine is 12 feet, which is the extent of its lateral operation. It is stated that the rotary motion of the digging tools distributes and minimizes the resistance and actually helps to propel the engine along. The digger hangs by four chains, two of which are connected with the axle collars of the main wheels of the engine and two others to the wheel which supports the digger frame, which last steers itself automatically. The digger easily adapts itself to uneven ground, and is put in and out of action in a few minutes. The value of the work done by the digger is stated to be equal to two 3-horse plowings, while land treated by it is better aerated and drained and dried than that plowed in the ordinary manner, and becomes consequently much more fertile. The digger is attracting great attention in agricultural circles throughout Great Britain, and is being widely adopted.

IV.—PLOWS.

While the types of plows manufactured are, of course, innumerable, those finding favor in South Africa have hitherto been relatively limited in number and their character controlled by the traditions of the population or by the place of origin of the various settlers. Among the Boers only the oldest, simplest, and cheapest types of plows have been in use in the past; and while there may be some exceptions, such implements are likely to remain so for a decade at least, owing to the straitened circumstances of the repatriated populations and the hindrances to the reception of new ideas and methods presented by their personal bias. For Boer purchasers, therefore, the lightest and cheapest class of plows, for hand labor, for pony, horse, or ox draft, are suitable; but animal traction is for several reasons, for a time at least, very much a desideratum. The demand in this quarter is at the moment urgent and considerable, but only those makers who are already in the field with appliances fitted to meet the demand have a chance of reaping any portion of the machinery harvest. The observations regarding the conservative tendencies of the Boer farmer and his predilection for the cheap article apply only to the average Boer farmer, who forms, however, the bulk of the population. There is, besides, a sprinkling of wealthier Boer agriculturists throughout South Africa, and especially in the Cape Colony, the Orange River Colony, and to a less extent in Natal, where the Boers are few in number, and in the Transvaal, who are receptive of broader ideas and whose farming operations are conducted on a scale and with appliances vieing with the most up-to-date English colonial practice. The catering for these can not be ignored, but their requirements more properly fall into that section concerned with the more modern requirements of European and English settlers.

Where up-to-date machinery is required.—The English farmer in South Africa, as well as European immigrants of other nationalities, is, consequently, the main consumer of modern farming machinery and implements of every kind. In the matter of plows his wants are diverse and progressive, but controlled by peculiarities of the soil and the configuration of the land tilled. Compared with that of the home country, his practice is, in the average run of cases, not so advanced; but it is, as previously said, marked by progressiveness, which is being further stimulated by the recognition of the great future in all departments of agriculture opened by the new order of things and the expansion of the mining industry. Exceptionally among English settlers there are also men of great wealth farming estates of considerable extent in the most up-to-date methods, and the catering for whose requirements creates an opening for modern appliances of all kinds.

Importance of the local factor.—Variety is added, alike in these as in the other cases, by the diversity of the products raised from the soil, which is further accentuated by the divergent climate and productive capabilities of different districts. Thus, in addition to wheat, barley, oats, millet, buckwheat, Indian corn, etc., vegetables—such as potatoes, pumpkins, melons, turnips, carrots, etc.—and hay, lucern, peanut, and other fodder, are grown tea, sugar, wattle bark, tobacco, corn, coffee, cotton, and other products of climes other than temperate; besides fruits, ranging from the grape to almost all the products of tropical countries. This diversity of products gives rise to the call for a multiplicity of appliances, and, so far as plows are concerned, creates an opening for many types manufactured in England certainly, but never seen in use on this side. Of such is the viticultural plow, or the plows used on tea and sugar estates, the most suitable patterns of which, after all, are merely modifications of the ordinary English implements. Even for plowing for cereals, normal English patterns need to be modified to some extent to suit South African circumstances. For a knowledge of the most appropriate patterns for the exigencies of farming in the subcontinent, the most successful manufacturers have been indebted to local study and investigation, and in the subsequent portions of these articles we shall seek to set out the main productions of English manufacturers to meet the requirements of the South African consumer.

V.—MULTIPLE PLOWS.

In considering the most advanced types of plows grouped under the heading of multiple plows, those adapted for use with steam power, and especially for deep plowing on a large scale, naturally claim first attention. Next in order follows those of more than one furrow, capable of being harnessed together for draft by an engine, or used separately, with horse or other draft power. Among these are included many types of plows, including disk plows, which are now attracting considerable notice in South Africa.

The Fowler plow consists practically of eight turnover plows yoked together, and is capable of plowing 40 acres of land a day and of accommodating itself to the most uneven ground. A different kind of plow works with the single and double steam-engine system. It is a three-furrow balance plow, the mechanism of which allows each set of plows to come into work alternately, as the machine may be advancing backward or forward across a field. When turning, both sets of colters are lifted off the ground and held in balance. It is termed the "Patent Special Cuban," and is fitted with revolving plows of knife shape. This principle is adapted to a variety of special-purpose plows and implements, including four and five furrow plows, grubbers, knifers, etc. The plows are made wholly of steel and are the most powerful of their kind constructed. The vineyard plows, ditching and draining machines, and other implements for working by steam are likewise built most substantially, and for the largest working capacity and the maximum of stress.

Of multiple-furrow plows are to be mentioned the "Colonist" double-furrow plows of Messrs. J. & F. Howard, Bedford, who were the pioneers of this type of plow in South Africa, for as early as 1848 their plows were in use there, with beams and handles of wood.

The Hornsby plow.—A useful type of plow of this kind, with special details, is manufactured by Messrs. R. Hornsby & Sons (Limited), Grantham. It is made with a tubular beam which gives the greatest lightness with strength. The arched form of the beam is claimed to give perfect clearness, with freedom from wobbling, the shares and colters always being in the direct line of draft.

Disk plows.—In concluding the notice of multiple plows, mention should not be omitted of those of disk pattern, which are now being largely used in South Africa. At a recent trial of plows in Natal, a four-disk and five-disk American rotary plow performed remarkable work, easily cutting through the baked soil and turning it over in such a pulverized condition as to render subsequent harrowing unnecessary.

AUSTRALASIA.

AUSTRALIA.

VICTORIA.

(*From United States Consul-General Bray, Melbourne, Australia.*)

HAND LABOR VS. MACHINERY.

The cost of hand labor in Victoria is altogether too great to permit the agricultural and manufacturing interests to thrive in any other manner than by an extensive use of machinery and labor-saving appliances of many descriptions. Modern agricultural implements are used in preparing the soil, sowing and planting the seed, cultivating during growth, and harvesting and gathering the crops.

AMERICAN IMPLEMENTS.

The American-made implement is far more generally used than any other, as it is more suitable to the requirements of the country, and with increased knowledge of those requirements a still greater demand would undoubtedly arise. While the American article, neatly made, up-to-date, and put on the market at a minimum price as it is, easily takes precedence over other makes, Canada, England, and the domestic manufacturer largely participate in the trade and the competition is very keen.

ROADS, ANIMALS, AND VEHICLES.

American vehicles are not by any means common here; it is, in fact, an unusual sight to see what an American would term an up-to-date vehicle, but there is no valid reason why such a condition of things should exist. The animals here are most suitable for the use of any kind of American vehicle, both for pleasure and freight, and while the roads in parts are somewhat too heavy and rough for the average-built American vehicle, such objection does not exist in the cities and towns. The tendency here is to use a vehicle somewhat heavier and stronger in wheels and axle than the American, and the trade is confined entirely to domestic manufacture.

There is no reason why our up-to-date vehicles and wagons of all classes should not find a very profitable field in this country, and they probably will, the only fear being that some may be put into the trade that are too cheaply constructed and which would bring into disrepute the very best make a little later on.

HOW TO INCREASE AMERICAN TRADE.

The American trade, both in agricultural implements and vehicles, can be best improved by the presence here of direct representatives of our manufacturers, who will canvass the country in a vigorous and thorough manner and sell a genuine article at a minimum cost which will prove in use and durability all it is claimed to be.

DEALERS.

The following are the names and addresses of the leading houses in Melbourne (the distributing point for Victoria) who are interested in the importation of agricultural implements and vehicles:

AGRICULTURAL IMPLEMENTS.

J. P. Richardson & Co., 326 Flinders lane.
Carolin & Co. Propy. (Limited), 191 Collins street.
David Edwards, 480 Elizabeth street.
R. Hornsby & Sons, 246 Spencer street.
Hugh Lennon, 415 Bourke street.
James McEwan & Co. (Limited), 119 Elizabeth street.
P. Rohs, 615 Little Collins street.
Welch, Perrin & Co., Queen's Bridge street.
John Buncle & Sons, 19 Wreckyn street.

VEHICLES.

Thomas Craine, City road.
J. P. Richardson & Co., 326 Flinders lane.
Burton & Knox, 106 Flinders lane.
J. Garton & Sons, 226 Little Bourke street.
Stickland & Sons, 20 Latrobe street.
D. White & Co., 86 Sturt street.

The following list of tariff rates has been furnished me by the comptroller-general of the Australian customs:

Article.	Rate.	Article.	Rate.
	Per ct.		*Per ct.*
Automobiles	20	Belting, leather	20
Axles, wagon and carriage	15	Cultivators	12½
Agricultural implements	12½	Corn planters	12½
Reaper and binder twine, per 112 pounds	$1.22	Corn huskers	Free.
Bobsleds	20	Cornshellers	Free.
Buggies	25	Carriages	25
Barn-door hangers	20	Carriage specialities	25
Baling presses	12½	Corn cleaners	12½
Boiler fronts	12½	Cutters:	
Boiler castings	12½	Stock	12½
Reapers and binders	Free.	Band	12½
Brass goods	20	Corn shredders (maize)	Free.
Binder sickles	12½	Castings:	
Binder sections	12½	Malleable	20
Bean harvesters	12½	Gray-iron	20
Binder guard and guard plates	12½	Carts	25
Binders:		Cultivator teeth	12½
Corn	12½	Corn harvesters (maize)	Free.
Grain	12½	Cordage	20

Article.	Rate.	Article.	Rate.
	Per ct.	Mills—Continued.	*Per ct.*
Cornshellers, hand	Free.	Corn and cob	12½
Clover hullers	12½	Grist (hand)	12½
Cutters, fodder	12½	Iron and brass (hand)	12½
Dump carts	25	Mill supplies	(†)
Drills:		Mill machinery	12½
Seed	12½	Machines:	
Press	20	Brick	Free.
Grain	*12½	Road	Free.
Corn	12½	Small thrashing	Free.
Fertilizer	12½	Mower sections	*12½
Drays	25	Mowers	*12½
Distributer, manure, lime, and fertilizer	12½	Lawn and pony	12½
Delivery vans	25	Lawn	12½
Evaporators	12½	Manure spreaders	12½
Engines	12½	Machinery:	
Thrashing	12½	Flour-mill	12½
Traction	Free.	Cereal-mill	12½
Engine tenders	12½	Harvesting	12½
Feed cutters	12½	Special mill and elevator	12½
Feed. cookers	20	Elevator	12½
Fencing wire	Free.	Power-transmitting	12½
Farm trucks	25	Thrashing	12½
Fencing:		Wire	12½
Wove-wire	Free.	Fence	12½
Wrought-iron	20	Grain-seeding	12½
Foundry work	20	Road	12½
Furnaces	20	Grain-cleaning	12½
Gasoline engines and pumps	12½	Hydraulic	12½
Gas-power plants	20	Ensilage-cutting	12½
Grain sieves	20	Refrigerator	12½
Grain separators	12½	Pumps	12½
Grass catchers	12½	Spray	12½
Harrows	12½	Force	12½
Disk	12½	Wooden	12½
Spring	12½	Iron	12½
Pulverizing	12½	Pump supplies	(†)
Spade	12½	Plumbing supplies	20
Horsepowers	12½	Phaetons	25
Hay loaders	20	Plows:	
Hayrakes	Free.	Wheel and walking	12½
Hay tools	Free.	Gang and sulky	12½
Hardware and carriage specialties	20	Chilled	12½
Harness	20	Shovel	12½
Hayracks	20	Grading	12½
Hay carriers	20	Plow blades	12½
Horse hoes	12½	Planters, corn (hand)	12½
Implements, farm	*20	Potato diggers	12½
Knives:		Potato sorters	12½
Mower	Free.	Potato cutters	Free.
Band-cutter	12½	Potato machinery	12½
Link belting chain, detachable	Free.	Power punchers	12½
Lawn swings	20	Power shears	12½
Locomotives	12½	Rock crushers	12½
Mills:		Rollers	20
Grinding	12½	Road graders	12½
Steel	12½	Reapers	12½
Saw	*20	Scrapers, wheels	20
Cane	12½	Scales	20
Cider	12½	Self-feeder for thrashing machines	Free.
Fanning	12½	Shoveling boards	20

*And free.

†20 and 12½ per cent.

Article.	Rate.	Article.	Rate.
	Per ct.	Wagons—Continued.	*Per ct.*
Seeders, broadcast	12½	Road	25
Silos	20	Bike	25
Silo fixtures	20	Dump	25
Shaft couplings	Free.	Mountain	25
Store ladders	20	Delivery	25
Shredders, fodder	Free.	Express	25
Scrapers	20	Lumber	25
Shovels	Free.	Windmill towers	20
Spades	Free.	Windmills	12½
Scoops	20	Windmill pumps	12½
Springs, wagon and carriage	15	Windmill tanks	12½
Sickles	Free.	Wheels:	
Truck rollers	20	Metal	20
Trucks:		Road	25
Log	20	Carriage	25
Gasoline-engine	20	Wind stackers	12½
Warehouse	20	Wagon end gates	20
Tanks, steel	Free.	Windmill regulators	12½
Transplanters	12½	Wheelbarrows	20
Umbrellas, rain, sun, and wagon	20	Wagon gears	25
Vehicles	25	Platform springs	15
Wagons:		If weighing machine	20
Farm	25	Weeders	12½
Spring	25	Well-drilling machines and tools	12½
Freight	25	Wheel hoes	12½

JOHN P. BRAY, *Consul-General.*

MELBOURNE, AUSTRALIA, *August 14, 1903.*

AGRICULTURAL MACHINERY IN AUSTRALIA.

The following article on agricultural machinery was printed in the British Trade Journal of September 1, 1903, under the caption "American competition in Australia:"

SYDNEY, *July.*

It is difficult at present to ascertain the extent to which the use of American agricultural machinery is increasing, if at all, in the Australian Commonwealth, but there can be no question that Canadian implements and appliances are regarded with more favor than formerly. At one time it looked as if American manufacturers would drive their British rivals from the field by reason of the attention given by them to Australian requirements. Not a few British manufacturers refused to recognize the fact that appliances doing good service on a British farm would be of little or no use on an Australian holding. It was here where the Americans had the advantage. Agriculture in California and other Western States was carried on under conditions similar to those existing in the cultivated portions of Australia; hence the appliances in use in America were also suitable for use in Australia. It has never been a question of price or quality, but rather of adaptability.

BRITISH AND AMERICAN FIRMS.

Of late years many of the leading British houses have abandoned their traditional policy, and instead of insisting that Australian farmers should buy what was offered them, whether suitable or not, they provide articles which their antipodean clients require little or no inducement to purchase. Within the last few years a marked improvement in the way of meeting Australian requirements has been observable in agricultural machinery of British origin. At the recent exhibition, the largest in the Commonwealth, of the Royal Agricultural Society of New South Wales, in Sydney, the displays made, respectively, by the local agents of Messrs. R. Hornsby & Sons (Limited), Messrs. J. & F. Howard, Messrs. Ruston, Proctor & Co., and others, were on a large scale and were unsurpassed by any of the American exhibits. The Hornsby collection included harvesting machinery, plows, plowshares, and seed-cleaning machinery; that of Messrs. Howard comprising almost every description of agricultural appliance, including the Nicholson harvester and the McSherry and Dowagree drills; also Osborne-Columbia reaping machines and Buffalo steam engines. The readiness with which the representatives of British firms also undertake business in connection with American houses was shown by the Australian representatives of Messrs. Ruston, Proctor & Co. showing American pumps, water lifters, corn huskers, fodder shredders, etc. Where the British article meets Australian requirements it is preferred; where it does not, the American or Canadian one takes its place. There is no predilection in favor of one or the other. There is, however, a tendency toward a somewhat uniform standard of excellence, the Americans adopting the best features of the British goods and British manufacturers returning the compliment with interest. Where the Americans lead is in the production of harvesters, which are continually being improved, the McCormick and Deering machines occupying the foremost places in public estimation. Canadian machinery has come largely to the front of late, but in only a few instances is there any marked superiority observable. It is more a matter of pushing business than of exceptional excellence.

PLOWS.

Sydney forming the port receiving the bulk of American goods imported into the Commonwealth, the New South Wales customs returns throw considerable light on the progress of the Australian trade in British, American, and Canadian agricultural machinery. The imports of plows in 1899 and 1901 were as follows:

From—	1899.	1901.
United Kingdom	£2,111	£511
Canada	1,455	4,264
America	8,621	5,478

The Canadian plow has several advantages over both the British and American articles, but recently a British plow has been quietly placed on the market and is said to be the best yet produced. Australian-made plows command a larger sale, however, than the whole of those imported oversea. They are made chiefly from British and American materials, the imports of which in 1899 and 1901 were as subjoined:

From—	1899.	1901.
United Kingdom	£6,103	£1,160
Canada	....	649
America	1,628	146

The falling off in 1901 was due to the drought, which led to the closing of many local works.

REAPERS AND BINDERS.

Turning to reapers and binders, the figures were:

From—	1899.	1901.
United Kingdom	£3,017	£320
America	2,026	2,504

Although considerable improvements have been effected in the British article, yet the American one is still largely preferred and commands the readiest sale, especially for large holdings.

OTHER MACHINERY.

In other kinds of agricultural machinery the returns were:

From—	1899.	1901.
United Kingdom	£2,672	£3,330
Canada	3,617	8,883
America	8,983	5,150

It will be seen that the competition of Canada is becoming more keen than that of America, the Canadian manufacturers endeavoring to combine in their goods the best qualities of the British and American articles. Hence, it is in this direction that the British manufacturers should look if they desire to retain their hold on the Australian market. In portable engines and boilers the United Kingdom practically maintains its own, all the imported portable engines being of British origin, the values in 1899 and 1901, respectively, being £1,454 and £5,175. In boilers the figures were: In 1899, £9,708; 1901, £28,452—the united Canadian and American imports in both years not exceeding £500.

LAWN MOWERS.

It is not improbable that the returns of 1903 will show an improvement in the British trade, with the exception of harvesters, reapers, binders, and plows, and that the competition of Canada will be most felt by American manufacturers. The quality of British production remains unsurpassed, but in adaptability there remains much to be desired. For instance, at least nine out of every ten British lawn mowers, while working easily on smooth, level lawns, are useless where the ground is otherwise; consequently, a lawn mower imported from Philadelphia commands the local market. It is light, of simple construction, and can be worked at almost any angle as well as on the level, the price being about the same as that of an ordinary British lawn mower. Several thousand have been sold in the Commonwealth during the last few years, and its salable quality has caused numerous storekeepers to discontinue their orders for the British article. Yet there is not a British manufacturer who could not, if he chose to take the trouble, produce an article as good as, if not superior to, that made in America.

There is a great deal in what the article offers in regard to the fitness of American implements, tools, etc. The lines along which development has gone for a hundred years in agriculture, mining, and manufacturing seem to have fitted the United States to furnish all the new countries with tools, implements, machines, and methods. Still, it will be best for American manufacturers to keep themselves posted as to the actual demands, tastes, etc., of foreign markets. As they increase in value, exports thither from the United States should grow larger and larger.

NEW ZEALAND.

(*From United States Consul-General Dillingham, Auckland, New Zealand.*)

HAND LABOR VS. MACHINERY.

The cost of hand labor in New Zealand is sufficiently great to justify the use of labor-saving machinery by the agriculturalists and manufacturers.

ROADS AND VEHICLES.

The roads throughout the colony are what might be expected in any new country—some of them being good and others not fit for pleasure driving.

IMPLEMENTS IN USE.

Modern agricultural implements are used throughout the colony, especially in the South Island, in preparing the soil, planting and sowing seed, cultivating during growth, and harvesting and gathering crops.

AMERICAN IMPLEMENTS

A limited number of American vehicles and wagons are used in different parts of the colony, and most of the agricultural implements in use are made in the United States. They are popular and the trade can be increased.

HOW TO INCREASE AMERICAN TRADE.

I think personal application would be the most effective means to increase the trade in these articles. Automobiles, which were unknown in this city two years ago, have been introduced to the extent of 50 or more, and are fast coming into favor. Under proper conditions this trade can be largely increased. Almost every article enumerated by the association for which this report is written can be successfully introduced here. At the present time American buggies are not generally used, although there are quite a number throughout the colony. Dogcarts, or in other words two-wheeled carts, are generally used, both for business and pleasure. American railway locomotives to the number of 87 were purchased by this Government two years ago, and are now in operation throughout the colony, and I believe are giving general satisfaction. American passenger coaches are also pretty generally used, while freight vans, road wagons, etc., of American manufacture are also in use. This is an exceptionally good field for mining machinery. It is true that some of the mines are already supplied with American machinery, but most of the machinery used is of British manufacture. I have not seen any American windmills in this part of the colony. There are, I believe, a few in the South Island. As already remarked, there is not an article on the list of the association before named which can not be introduced here, if that has not already been done.

DEALERS.

In Auckland the houses who deal largely in American machinery are T. & S. Morrin, Cruickshank, Millar & Co., E. Porter & Co., Briscoe Company, John W. Chambers & Co., and John Burns & Co

DUTIES.

The tariff rates imposed on machinery are as follows: Agricultural and garden implements that require to be worked by horse power, milling, dredging, oil-refining, boring, refrigerating, or meat-preserving machinery, etc., 5 per cent ad valorem; electric machinery and appliances, 10 per cent ad valorem; machinery n. o. e., 20 per cent ad valorem.

FRANK DILLINGHAM,
Consul-General.

AUCKLAND, NEW ZEALAND, *July 20, 1903.*

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DEPARTMENT OF COMMERCE AND LABOR
BUREAU OF STATISTICS

VOL. XXVIII

SPECIAL CONSULAR REPORTS

COMMERCIAL TRAVELERS IN FOREIGN COUNTRIES

WASHINGTON
GOVERNMENT PRINTING OFFICE
1904

PUBLICATIONS OF THE BUREAU OF STATISTICS, DEPARTMENT OF COMMERCE AND LABOR.

The publications of the Bureau of Statistics, Department of Commerce and Labor, are as follows:

Group I.—*Foreign Commerce of the United States:*

Annual Report on the Commerce and Navigation of the United States.
Annual Statistical Abstract of the United States.
Monthly Advance Sheets from the Summary of Commerce and Finance.
Monthly Summary of Commerce and Finance of the United States.
Monthly Bulletin of Exports of Domestic Breadstuffs, Provisions, Cotton, and Mineral Oils.
Monthly Imports and Exports of the United States (total values, single sheet).

Group II.—*Consular Reports:*

Commercial Relations, being the annual reports of consular officers on the commerce, industries, navigation, etc., of their districts.
Review of World's Commerce, being a summary of the annual reports contained in Commercial Relations.
Consular Reports, issued monthly, and containing miscellaneous reports from diplomatic and consular officers.
Daily Consular Reports, issued daily, except Sundays and legal holidays, for the convenience of the press, commercial and manufacturing organizations, etc.
Exports Declared for the United States, issued annually, containing the declared values of exports from the various consular districts to the United States. (Commencing with the issue of December, 1903, to be published in the Monthly Summary of Commerce and Finance.)
Special Consular Reports, containing series of reports from consular officers on particular subjects, made in pursuance to instructions from the Department.

The above consular reports were until July, 1903, issued by the Bureau of Foreign Commerce of the State Department; since that date they have been issued by the Bureau of Statistics of the Department of Commerce and Labor, with which the Bureau of Foreign Commerce of the State Department has been consolidated. For details of these publications, the subjects of which the special reports treat, and the reports remaining for distribution, address "Chief, Bureau of Statistics, Department of Commerce and Labor, Washington, D. C."

In 1890 was begun the publication of reports on special subjects, in separate form, of which those of the following titles are now available for distribution:

Vol. 2 (1890 and 1891).—European Emigration, Olive Culture in the Alpes Maritimes, and Beet-Sugar Industry and Flax Cultivation in Foreign Countries.
Vol. 3 (1891).—Streets and Highways in Foreign Countries. (New edition, 1897.)
Vol. 5 (1891).—Canals and Irrigation in Foreign Countries. (New edition, 1898.)
Vol. 6 (1891 and 1892).—Coal and Coal Consumption in Spanish America.
Vol. 7 (1892).—The Stave Trade in Foreign Countries.
Vol. 10 (1894).—Extension of Markets for American Flour. (New edition, 1897.)
Vol. 11 (1894).—American Lumber in Foreign Markets. (New edition, 1895.)
Vol. 12 (1895).—Highways of Commerce. (New edition, 1899.)
Vol. 14 (1898).—The Drug Trade in Foreign Countries.
Vol. 15 (1898).—Part I. Soap Trade in Foreign Countries; Screws, Nuts, and Bolts in Foreign Countries; Argols in Europe, Rabbits and Rabbit Furs in Europe, and Cultivation of Ramie in Foreign Countries.
Vol. 16 (1899).—Tariffs of Foreign Countries. Part I. Europe. Part II. America. Part III. Asia, Africa, Australasia, and Polynesia. Supplement (1900). Tariffs of Chile and Nicaragua.
Vol. 17 (1899).—Disposal of Sewage and Garbage in Foreign Countries; Foreign Trade in Coal Tar and By-Products.
Vol. 18 (1900).—Merchant Marine of Foreign Countries.
Vol. 20 (1900).—Part I. Book Cloth in Foreign Countries, Market for Ready-Made Clothing in Latin America, Foreign Imports of American Tobacco, and Cigar and Cigarette Industry in Latin America. Part II. School Gardens in Europe. Part III. The Stave Trade in Foreign Countries.
Vol. 21 (1900).—Part I. Foreign Markets for American Coal. Part II. Vehicle Industry in Europe. Part III. Trusts and Trade Combinations in Europe.
Vol. 22 (1900 and 1901).—Part I. Acetic Acid in Foreign Countries. Part II. Mineral-Water Industry.
Vol. 23 (1901).—Part I. Gas and Oil Engines in Foreign Countries. Part II. Silver and Plated Ware in Foreign Countries.
Vol. 24 (1902).—Creameries in Foreign Countries.
Vol. 25 (1902).—Stored Goods as Collateral for Loans.
Vol. 26 (1903).—Briquettes as Fuel in Foreign Countries.
Vol. 27 (1903).—Markets for Agricultural Implements and Vehicles in Foreign Countries.

Of the monthly Consular Reports, many numbers are exhausted or so reduced that the Department is unable to accede to requests for copies. Of the publications of the Bureau available for distribution, copies are mailed to applicants without charge. In view of the scarcity of certain numbers, the Bureau will be grateful for the return of any copies of the monthly or special reports which recipients do not care to retain. Upon notification of willingness to return such copies, the Department will forward franking labels to be used in lieu of postage in the United States, Canada, the Hawaiian and Philippine Islands, Porto Rico, and Mexico.

Persons receiving Consular Reports regularly, who change their addresses, should give the old as well as the new address in notifying the Bureau of the fact.

In order to prevent confusion with other Department bureaus, all communications relating to Consular Reports should be carefully addressed, "Chief, Bureau of Statistics, Department of Commerce and Labor, Washington, D. C."

DEPARTMENT OF COMMERCE AND LABOR

U. S. — BUREAU OF STATISTICS

Anal.

VOL. XXVIII

SPECIAL CONSULAR REPORTS

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COMMERCIAL TRAVELERS IN FOREIGN COUNTRIES

WASHINGTON
GOVERNMENT PRINTING OFFICE
1904

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COMMERCIAL TRAVELERS IN FOREIGN COUNTRIES.

The following interesting and instructive series of reports on the regulations concerning commercial travelers in their efforts to secure trade in foreign countries were prepared by Mr. E. C. Meyer, United States Deputy Consul in Chemnitz, under the direction of the consul, J. F. Monaghan. At a time when the United States is seeking trade in far-off parts of the world a knowledge of the rules and regulations under which its agents will be permitted to seek trade is almost indispensable. It is hardly necessary, perhaps, to remind merchants and manufacturers that such regulations and rules are subject to change. The book from which the following are taken was compiled by Dr. August Etienne, under the title "Export Handbook," and was published for the express purpose of doing for the German commercial world just what it is hoped this translation and compilation will do for the merchants and manufacturers of the United States.

EUROPE.

AUSTRIA-HUNGARY.

Foreign commercial agents, who have in their possession trade licenses issued by the proper authorities of Austria-Hungary, enjoy freedom from taxation. Such agents may carry samples with them, but no salable goods. Samples are free of duty if reexported within a stipulated time and if their identity is satisfactory.

In the solicitation of orders for goods, the following regulations of February 25, 1902, are in force:

The proprietor of a business, or his lawful agent, may solicit orders for only such goods as are common to his trade, and only from such business men as deal in those specific goods. For the solicitation of orders for goods not regularly handled, a special written license enumerating the goods in question is required. In special cases, out of respect for peculiar considerations, the Minister of Commerce is empowered to avoid the effect of the law and permit the solicitation of orders for irregular goods.

In accordance with the administrative ordinances of the Austrian Minister of Commerce of September 4, 1902, orders may be solicited for the following commodities outside of the locality in which the proprietor or agent does his regular business without subjection to the aforenamed restrictions:

1. Heavy machinery, motors, and parts of same.
2. Building material, including stones and other artificial building material, cork, and paving material.
3. Technical supplies, and apparatus for heating, lighting, and waterworks, both public and private.
4. Wooden lattices and blinds.
5. Sewing machines, typewriters, and bicycles.

Sample cases are transported upon the railroads of Austria-Hungary under preferential tariffs, which rates can, however, only be enjoyed under certain conditions and through the observance of prescribed formalities. The rates vary. In some instances they are 2 hellers (0.4 cent) per 10 kilograms (22 pounds) per 1 kilometer (0.6214 mile), and in others 25 kilograms (55 pounds) are free, with a small charge for excess.

In order to enjoy the benefit of the reduced rates agents must apply to specified authorities located only in certain cities for the issuance of identification cards and licenses, on which appear the name of the traveling agent and the firm which he represents, the number and contents of the cases carried with him, the seal and signature of the issuing authority, and the signature of the agent.

The trade license is issued for the period of one calendar year only, and hence expires on the 31st of December of each year. The identification card must, in addition to the seal and signatures of the issuing authorities and the signature of the agent, contain a photograph of the agent in size resembling an ordinary visiting card.

A record is kept of all the licenses and cards issued, and all regulations pertaining to the same are stringently enforced. These papers must be continuously carried on the person of the agent, as the probabilities are that they will be needed again and again. In case of loss, a new license is issued free of cost if proper evidence is at hand that a previous license had really been issued. Every change of person must be reported by the firm and the license and identification card made out to the new representative.

The railroad authorities reserve to themselves the right to inspect the sample cases carried by agents, even though properly issued identification cards and licenses are presented. In case any salable goods are contained in the same, the entire cases are subject to the regular freight and transportation rates, the preferential rates falling away. Salable goods, as well as the personal effects of the agent, must be specially declared and are supplied with special checks.

Sample cases must, if their owner wants to enjoy the benefit of the lower transportation rates, be supplied with the name of the firm under whose direction the journey is undertaken, which name must be placed upon each individual case in a durable and lasting manner. The attachment of a visiting card, or the writing of the firm's name upon a random piece of paper, is insufficient, even though the same be firmly attached. The printing or painting of the firm's name is considered as the surest observance of the regulation. Cases which lack such identification are excluded from the benefit of the reduced rates. It has also been held that cases which are supplied with removable slides of wood or metal, or other durable material containing a lasting record of the firm's name, are acceptable; but in case such labels can be closed care must be taken to have the lids open during journey, so that the firm's name is easily discernible.

The commercial agent is required to accompany his cases on the same train and call for them at the depot within half an hour after the arrival of the samples. In case of his failure to do so, he is required to pay the difference between the reduced rates and the regular rates. Not the agent but the firm is liable for a violation of the railroad regulations concerning the transportation of sample cases. A common penalty for a violation is the rejection of the privilege of preferential rates in the future.

In Hungary entry of samples can be made free of duty, with the exception of all combustibles and tobacco. Goods are also free of duty if their weight is less than 25 grams or the duty upon the same is less than 2 kreutzers (0.4 cent). This is construed to mean that all the individual packages of the same kind of goods entered at one and the same time do not exceed the weight of 25 grams or the duty of 0.4 cent. This regulation is also in force to cover goods sent into Hungary through the post.

BELGIUM.

Traveling agents, when supplied with regular cards of identification (Legitimationskarte), are exempt from the payment of a business tax in Belgium. They may carry samples but no salable goods. They may purchase goods from merchants or producers and take orders for the lines of merchandise which they carry. Samples stamped with the country of their origin are admitted free of duty if accompanied by a "sample passport;" if not stamped with the country of their origin, they must be supplied with the Belgian stamp on payment of the regular duty. Upon reexportation of the goods, such duty is refunded.

Commercial agents who carry salable goods with them are obliged to take out a trade license in the first city in which they arrive. The amount of the fee exacted for such a license varies, as additional payments of diverse kinds may be legally required in specific cases. The refundment of duties paid upon salable goods is prohibited.

Samples of wines are admitted free of duty when the authorities feel convinced that it is the honest intention of the importer to use them solely as samples and when the capacity of the bottles does not exceed 15 centiliters (5.07 fluid ounces).

BULGARIA.

Commercial agents who are supplied with business identification cards and passports issued by their own country may take orders from merchants or producers without the payment of a trade tax and may carry samples for this purpose. Salable goods may not be carried when on the road. Samples of goods which are subject to duty are temporarily admitted free of duty when the agent has observed all the prescribed tariff formalities requisite to insure their reexportation or deposit in a port of entry.

Every traveling agent must report to the chamber of commerce or other authorities of the locality which he canvasses the name of the firm represented by him, and must also produce to the authorities a certified copy of his power of attorney. Powers of attorney issued by unknown firms must be certified to by the diplomatic representative of the agent's country, and also by the Bulgarian Minister of Foreign Affairs. Boundary officials may only admit agents whose passports and business papers are in proper condition.

DENMARK.

Traveling agents are required to pay an annual trade tax of 160 crowns ($42.88) in Denmark. In case the agent represents several houses, he is required to pay the above full amount for the first house and half that sum for each of the other houses. The date of the payment of the tax is counted as the first day of the year. Payment must be made at the first custom-house at which the agent arrives. In the way of papers, the agent must produce either an attest from his home government officials, giving his name and that of the firm which he represents, or a power of attorney issued by his firm and certified to by some notary public as well as by a Danish consul. It is well to bear in mind that the legalization of the signature to the power of attorney by some consul of the agent's country residing in Denmark is insufficient. The receipt issued to the agent by the customs officials on payment of the tax must be visaed by the local police authorities before such agent is entitled to conduct his business. A similar visa must be obtained from the police department of every city in which business is done.

The above-named papers may not be made out in the name of a firm in such a way as to enable different members to use the same, but must be made out to one specific person. In cases where a house is compelled to change its traveling agents in the course of the year, the proper transfer of the trade license to the new representative is made by the Danish officials free of charge. On the other hand, a retransfer of the license to the original bearer is not permissible.

Traveling agents may do business only in Copenhagen and in such other Danish cities as are included in the definition of "trading cities," or "Handelsstaedte." However, even in these cities business with wholesalers, retailers, manufacturers, etc., must be confined exclusively to the particular line of goods regularly handled by such parties. The single contracts and sales to wholesalers must be confined to that class of goods which wholesalers are permitted to deal in under the law of December 29, 1857. Under this law the minimum quantity that may be the subject of a transaction is, in general, limited to 40 crowns ($10.72).

Samples are dutiable, but on their reexportation such duty is refunded on demand under limitation of the following regulations:

1. The samples must, on the importation, have been designated as intended for reexportation. The contents of the sample cases must be designated with the greatest possible accuracy as to kind, number, distinguishing labels, etc. A summary specification must be subjoined to the custom-house receipt to expedite matters on the reexportation of the samples.

2. Aside from these requirements the customs officials may demand any further declarations or papers that in any particular case may be deemed advisable. On refusal to meet these additional demands, a record is made upon the custom-house receipt to that effect, and the deposited duty is refunded only upon direction of the general-director of taxes in consequence of an appeal.

3. All imported goods must be reexported if advantage is to be enjoyed of the refundment of the duty.

4, Upon the reexportation of goods, which must obtain within four months after their importation, a written and sworn statement or declaration as to the identity of the goods must be added to the original custom-house receipt.

5. The refunded duty must be called for within twenty-eight days after the exportation of the goods.

6. In every single case of refundment, a tax stamp of 65 öre (17.4 cents) must be attached to the original declaration of reexported goods.

FINLAND.

No business tax is levied in Finland in case of foreign traveling agents. Samples are subject to the following regulations:

A traveling agent who is supplied with the proper passports and business identification card is admitted into the country, and in case he carries samples these must be supplied with custom-house stamps. At the same time the customs authorities must make a complete and specific list of such samples, which the traveling agent is required to produce at the custom-house from which he wishes to reexport his samples. If the agent, instead of depositing the regular duty upon his samples with the customs authorities, prefers to give bond for the amount, such a bond must be executed by two or more citizens of Finland. In case the bondsmen are unknown to the Finnish authorities their signatures must be legalized by a local notary public. All samples not reexported from the country within four months from the time of their importation forfeit their right to exemption from duty. The deposit is, as a result, canceled, or in case bond was given the agent, or in his failure his bondsmen, is liable for the amount of his duty.

FRANCE.

Traveling agents who carry no goods for sale, but only samples, enjoy freedom from all taxes in France. A proper business indentification card issued by the competent authorities of the agent's country is sufficient. He is, however, limited in his activity to business transactions with those firms which deal in his specific goods. The samples entered are exempt from duty if reexported within one year from date of entry. The regular duty must, however, be deposited with the custom-house officials or proper bonds given for the amount. If the goods upon entry already bear the stamp of the customs authorities of the agent's country, a second attachment of identity signed by the French authorities is unnecessary.

Traveling agents who carry goods for sale are classified with peddlers or hawkers in France; no special trade license is required, and they cease to be traveling agents in the eyes of French commercial law. As peddlers they must, however, apply for a trade license, which is made out anew at the seat of government in every Department visited by the agent. The business tax in such a case varies in a somewhat peculiar way, according to the method of the transportation of the goods. As a rule, the tax is about 8 francs ($1.55) per year. Aside from this a fee of about the same amount may be exacted by the local authorities who issue the trade license. A renewal of this latter fee is not required on the removal of the agent to some other part of the country, although the license must be produced to the local authorities of each community entered by the agent.

Samples sent into the country or any other dutiable articles transported into France through the mails are either delivered to the addressee upon payment of the duty or are held by the postal authorities pending the payment of the duty by the sender.

GERMANY.*

(1) All foreigners who intend to do peddling or who desire to ply their trade traveling (from town to town) must have a license.

(2) A license, however, is not needed by foreigners who import and sell farm and garden products, fruit, eggs, poultry, beeswax, and honey; but such foreigners may be prevented from carrying on their trade (*a*) if they are afflicted with a repulsive or contagious disease, or if they are disfigured in a repulsive manner; (*b*) if they are under police surveillance; (*c*) if they have ever served a sentence of three months or more for any criminal act or misdemeanor, unless at least three years have elapsed since the expiration of such sentence; (*d*) if they are known as habitual drunkards or vagrants; (*e*) if they are not yet 25 years of age, unless they are the support of a family; (*f*) if they have no residence as distinguished from domicile in Germany; (*g*) if they have ever been fined or punished in any way for violating any of the ordinances referring to peddling; (*h*) if they have one or more children who are not properly cared for or

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* The notes on commercial travelers in Germany appeared in CONSULAR REPORTS No. 199. Up to date no change has been noted in German regulations covering commercial agents In all cases no harm can come from agents or principals consulting United States consular officers—the latter before the agents are sent, the former always upon arrival in a new country.

who, if between 6 and 14 years of age, are not receiving sufficient education.

(3) A license is to be refused if the full number of licenses allotted to the district has already been issued, or if, in the district for which a license is sought, no want is felt for such line of trade (or goods) which the applicant intends to carry on.

(4) Peddlers and menders of crockery, tin, and wire ware, and similar articles, organ grinders, and street musicians can get a license only when they have had one for the same trade during the preceding year. No license is to be issued to gypsies.

(5) A license is only for the district for which it was issued, but may be extended by the proper authorities. A license, however, at no time protects any foreigner from being sent out of Germany, if the authorities see fit to do so.

(6) A license may be issued for a shorter period than the calendar year, or for certain days only.

(7) Persons having a license must also have a special permit in order to be allowed to be accompanied by others. Such permit, however, can not be granted for anyone who, if applying for a license himself, would be barred by reason of not meeting any of the requirements contained in the foregoing sections. Permission to take along persons of the opposite sex, unless in the case of husband and wife, or vice versa, or one's own children or nephews over 21 years old, can be refused, unless as hereinbefore provided for.

Commercial travelers in particular.—(1) Commercial travelers who are in possession of the special license specified in the treaties are subject to all the stipulations of the treaties. If commercial travelers carry the goods they sell with them, or if they buy goods or solicit orders from other persons than merchants or manufacturers without express previous request, they must comply with the regulations laid down under it (see above). Excepted, however, are those soliciting orders for printed matter, books and pictures, wine, linens, and sewing machines.

(2) The special license for a commercial traveler entitles the holder, after payment of the regular fees, dues, usual taxes, etc., to carry on business throughout the Empire. As to the issuing, refusing, or forfeiting of the special license the same rules apply as above laid down.

(3) Goods bought in the regular course of business may be taken along to their place of destination. Commercial travelers selling goods are only allowed to carry samples (patterns) of the articles they sell.

GREAT BRITAIN.

Commercial agents who travel in the British Isles are exempt from all taxes and special trade licenses or concessions, except in case of those commodities for the sale of which special public license is requisite. In the latter case foreign agents are subject to the regular trade regulations governing the sale of excise commodities, which have been established as follows:

For trade in—

Liquors, alcoholic	$51.09
Wines	51.09
Beer	16.08
Patent medicines (*i. e.*, medicines not prescribed by a regular doctor)	1.22
Tobacco	1.28
Silverware (as determined by the proportion of gold and silver contained therein)	$11.19 to 27.98

In distinction from most other countries, samples and salable goods may be carried and business done with same by commercial agents without special authorization, passport, or certificate. But in case of those commodities for the sale of which special trade licenses are necessary, the production of such licenses upon request is made obligatory upon foreign agents in the same manner as upon citizens of the country.

Where samples are dutiable, such duty must be deposited, but refundment is made if the same are reexported within one year from the date of their entry. In securing the identity of the goods it is necessary in this connection to observe the requirements of the English law on trade-marks, under which certain commodities may not be handled under any trade-mark at all and others not without one.

The following regulations hold good at present for the importation of samples of commodities drawn from foreign soil and transported directly to some English commercial agent, retailer, or consumer:

1. Samples of tea are free of duty if their weight does not exceeed 1 ounce.
2. Samples of cocoa and coffee are exempt from duty in quantities of less than half a pound.
3. Samples of unmanufactured tobacco weighing less than 6 ounces are free of duty and may be imported per "sample post," or as samples without value.

GREECE.

Traveling agents who properly identify themselves by business passports are exempt from taxation. Dutiable samples must be declared to the customs officials, whereupon they are supplied with Government seals and distinguishing labels. The duty on the same must be paid or proper security given therefor. The duty is refunded or the surety relieved if within three months the samples are reexported. The three months' limit may in certain cases be extended to a full year. Such extension can, however, only be granted by the customs authorities of the place where entry was made. For this reason, as well as for other considerations, it is reported that experience has shown an extension of the time limit to be associated with many inconveniences and formalities which make it advisable for traveling agents to so arrange their tours as to complete their work within the time prescribed. Samples which after regular entry are transported to some other city than that in which entry was made are not subject to any further tariff formalities, but must be accompanied by a "declaration de transport" issued by a competent customs official at the original port of entry. This declaration covers the transportation of the samples to any part of Greece.

ITALY.

Commercial agents traveling in Italy are exempt from all taxes or fees if provided with the prescribed trade licenses, which properly identify themselves, show whom they represent, and the nature of their business. The regulations concerning dutiable samples are very similar to those already described for other countries—namely, that the amount of the duty must either be paid in cash or proper security given for the same, and that upon the reexportation of the samples, proper proof being furnished of their identity, such duty is refunded or the surety relieved.

The importation and exportation of samples may be executed at any port of entry of the first grade, as well as at any one of the first class in the second grade. When the agent does not accompany his samples personally, a written entry must be made, otherwise his verbal statements are accepted. Samples must, wherever possible, be supplied with identifying labels, or where the attachment of identifications is impossible a thorough description of their character must be entered at the custom-house. No fee may be exacted for the attachment of labels and stamps, except in case of certain textiles which are difficult of proper description and identification. In order to avail of the privilege of the refundment of the duty all samples must be reexported within one year from the date of their entry. Such reexportation may be made through a custom-house other than that of their entry. The customs declarations as to the identity of the samples reexported may be made verbally.

"Samples without value" which represent a part of a commodity are free of duty. This includes all samples of paper and tapestry up to that size which is requisite to illustrate the entire design or pattern of the stuff. Samples of porcelain wares constituted of parts comprising varying patterns are also exempt from duty if the shipper is able to show that the component parts as sent are useless for any other purpose than that for which they were expressly made.

A matter that also requires mention here is the existence of severe and stringently enforced regulations governing the use of the mails in sending valuable commodities of small dimensions into Italy. Years ago the Government package post was much abused by the sending of silver and gold valuables through the same for the evident purpose of evading the duty. The general form of sending was by registered letter or as "sample without value." This illegal practice assumed such dimensions that special surety companies were organized, having for their purpose the guaranteeing of the safe delivery of the valuables on payment of a premium. To overcome these extensive customs evasions new regulations were put in force under which the postal authorities were to cooperate with the tariff authorities by opening suspicious packages and returning all that contained dutiable commodities to the sender. This revealed such widespread violations of the Italian customs law, and imposed such heavy duties upon the returning authorities, that more stringent measures became necessary. At present, therefore, every suspicious package or registered letter is opened, and if the contents are dutiable articles the recipient, or addressee, is required to pay thrice the regular duty, as well as a heavy fine in money. Since such expenses are generally charged to the sender, legal complications have been a frequent consequence of the operation of the new regulations. It is therefore advisable that commercial agents and others bear in mind the severe administration of the postal laws in making communications of this kind with Italy.

NETHERLANDS.

In the Netherlands foreign commercial agents are required to apply for a trade license at the first custom-house which they reach. These licenses (billet von de bedryfsbelasting) are issued on payment of a fee of 15 gulden ($6.03). In case samples are carried a transit passport must be applied for, in which all samples are entered after being supplied with proper labels. In addition to this, 25 per cent of their market value must be deposited as a guaranty for their reexportation. If any samples, or parts of any samples, are sold or missing the full duty upon the entire lot must be paid. If the agent desires to leave the country through some port of entry other than that specified in his transit passport, application must be made to the authorities of the original port of entry for a transfer of his entry record to the port from which he expects to sail or leave.

These passports are issued free of cost and, in accordance with the wishes of the traveling agent, for a period of three, six, or twelve months.

Where entry is made of samples which are unaccompanied by the agent, the following regulations are in operation:

1. Small samples of no value in trade, such as patterns of manufactured goods which are not adapted for any other commercial use, patterns of tapestry, cigar labels, etc., all of which are without value to the consumer, are admitted free of duty.

2. Samples of wines and whiskies imported in quantities of less than three-tenths of a liter are also free. It does not matter if the total contents of the bottles aggregate a considerable quantity, as 150 liters (153 gallons).

3. Samples of articles like sugar weighing less than 15 decagrams (5.29 ounces) are free of duty, if there exists no reason for believing that it is the intention of the importer to use the same for any commercial purpose.

NORWAY.

In Norway all foreign traveling agents are required to apply for a trade license, which is issued upon the payment of a fee of 100 crowns ($26.80) and is good for the period of thirty days. Commercial agents are under the direct control of the police, and are under obligations to produce their licenses in every town in which business is done for the purpose of having them visaed. No fee is due for this official act.

Violations of these regulations are punishable with a fine of from $26.80 to $134.

In accordance with the law of May 4, 1902, traveling agents and foreigners in general are required to apply for a so-called "sojourner's passport" at the police department. Lately, however, a further rule was added that in case of traveling agents who have received a proper certification from the police on the front page of their trade licenses to the effect that their arrival has been duly reported to the police department and entered in the police register for foreigners no special "sojourner's passport" is required.

But this latter regulation does not affect the other provisions of the law of May 4, 1902, bearing upon commercial agents, under which they are bound to report personally to the police for the inspection of their papers in regard to means of existence, prospects of future sustenance, etc.

When samples are carried the duty upon the same must be deposited. On their reexportation the amount deposited is refunded, provided a declaration was made at the time of the entry of the samples to the effect that their reexportation would follow, and if the identity of the samples is satisfactorily established. The Norwegian customs authorities supply samples with distinguishing labels, as far as this is possible.

PORTUGAL.

In Portugal foreign commercial agents are subject to a tax which varies, according to the nature of the business conducted, from 5 to 28 milreis ($5.40 to $30.24) per year. Samples entered which represent dutiable goods are registered by the customs authorities and supplied with proper identification labels. The duty must either be deposited or bond given for the amount, pending the reexportation of the samples. All samples which were regularly registered on entry may be transported to any part of Portugal without being subject to any further tax or fee.

ROUMANIA.

Traveling agents who sojourn in Roumania for less than three months, showing goods and taking orders, are exempt from all taxes. If this time is exceeded they are, in common with all foreigners, subject to the regular tax. They are required to report in writing their arrival in a city to the local chamber of commerce, and also present the powers of attorney authorizing them to do business for the given firm or firms. In case there is no chamber of commerce in a town, such report is to be made to the mayor. Agents must invariably be supplied with a trade license. In order that a power of attorney may be recognized it must have been visaed by the diplomatic representative of Roumania accredited to the country of which the agent is a citizen or in which the firm is located which issued to him the power of attorney to do business for its account. A copy of this power, properly certified, must accompany the written announcement to the local chamber or mayor. Upon receipt of these papers by the chamber, that body issues a certificate to the effect that the agent is qualified to do business in the locality.

Where samples are entered they must be accompanied by a written declaration giving an exact enumeration of all the goods carried. At the same time the agent must state a time limit within which he intends to reexport his samples. The duty on the same must be deposited or bond given for the amount. In case all samples are reexported as indicated by their identity in the official registers, the duty is refunded or the bond canceled.

RUSSIA.

Russia, the land of great possibilities for the merchant, imposes numerous taxes and fees upon the foreign commercial agent, or commercial house established within its borders, though the taxes have been considerably modified in character and reduced in amount during recent years.

A commercial house represented in Russia by an agent is subject to the following taxes:

(*a*) A State or real property tax of 150 rubles ($77.25). Before 1901 this tax was 500 rubles ($257.50) for all foreigners, but since that date the reduced tax has been in force for all merchants of foreign nationality with the exception of the Jews, who still pay the former tax of 500 rubles.

(*b*) A communal tax of 45 rubles ($23.17), which is paid but once.

Single traveling agents who have no permanently located house in the Russian Empire are subject to the following taxes as individual merchants:

(*a*) A State industrial tax of 50 rubles ($25.75).

(*b*) A communal tax of 10 rubles ($5.15).

In addition to this regular communal tax, there are a number of smaller taxes and fees to be paid to the local authorities. These are said to be insignificant, as a rule, and are expended for the benefit of the lower commercial schools. There is also a small tax, in the form of a supplementary tax of 10 per cent of the amount of the regular fee, exacted on the issuance of the trade license, the trade-license fee being a State tax, while the 10 per cent tax is a local communal tax.

Upon arrival in Russia, traveling agents are required to report at a custom-house and obtain receipt upon payment of the prescribed fee. This receipt operates as a trade license and is good from the day of its issuance to the 1st of January following. It is attached to the national passport which every foreigner is compelled to produce on crossing the boundary of Russia, together with his power of attorney. These papers must be presented to the local industrial authorities of the place where business is to be done. In case of agents who travel in Russia only between July 1 and December 31 of each year the 50-ruble tax need be paid for the half year only. Where a commercial house with permanent offices does business only during the second half of each year, the 150-ruble tax is reduced to 75 rubles ($38.63); but in case the proprietor of the house is of Jewish blood, he pays 250 rubles ($128.75), instead of the 500 rubles.

In case the head of a firm comes to Russia to do business without, however, establishing permanent offices, warehouses, etc., he is required to pay 150 rubles ($77.25); in case he is of Jewish origin, 500 rubles ($257.50). Where offices, depots, storerooms, etc., are established, a tax of 500 rubles ($257.50) is levied for the conducting of a wholesale trade and 450 rubles ($231.75) for the conducting of a retail trade. When the head of the firm is a Jew he must, prior to entering into such business, receive permission from the Ministers of Finance, of the Interior, and of Foreign Affairs, in accordance with a circular issued November 27, 1900. In such a case, where the privilege is granted, the tax is 500 rubles ($257.50), whether the trade be wholesale or retail.

In the adjustment of the taxes for Jews the general rule prevails that the religion of the head of the firm determines the religion of the firm as a whole and of all agents and representatives sent out by such a firm. The proof of the religious denomination of a firm is attached to the trade license through the instrumentality of the compulsory visa. Certain special regulations are also in force covering Jewish traveling agents who desire to enter Russia for a period of three or six months.

When samples are carried by the traveling agent care must be taken to obtain a trade license, which for the sake of convenience is issued by the customs authorities of the port where entry is made, because it is only upon presentation of such license that the samples are admitted into the country without payment of the regular duty. Where the license is produced, the samples may be entered upon deposit of the amount of the duty, which is refunded upon the reexportation of the samples as evidenced by the identifying labels which the Russian customs authorities attach to the same at the time of their entry.

The time limit within which the samples must be reexported in order to obtain the refundment of the deposited duty was recently extended from six months to one year. Another reform which is a great convenience to agents carrying samples was instituted simultaneously with the preceding in that the reexportation of samples may be made through ports of entry other than the one through which the samples were originally entered. The agent must, however, prepare two copies of a list of all his samples, and record weight, measurement, and other characteristics which might serve to identify them.

Firms that enter Russia with the intention only of making purchases of Russian goods are exempt from all taxation, and every possible freedom is accorded them for the transaction of their business.

Entry of samples need not necessarily be made at custom-houses on the boundary; the samples may be shipped to some port of entry in the interior and the entry made there. However, it is said to be advisable to enter samples or other goods on the boundary wherever possible without loss or great inconvenience, because the fees and taxes are higher for entries made in the interior, including fees for trade licenses, etc. There is also said to be no regulation prohibiting the payment of the local taxes at some place where they are low (there is a difference in the amount to be paid in different localities).

For the entry of samples of combed wools Russia has prescribed special regulations. Such samples are admitted free of duty if they comply with the following requirements: They must be entered as samples and must not possess the appearance and character of salable goods; they must not exceed 4 "lot" in weight; they must be entered by some traveling agent or be addressed to some Russian wool manufacturing establishment.

SERVIA.

Traveling agents who possess the required trade license, aside from their regular passports, are exempt from all taxes, provided they solicit orders only from merchants who deal directly in their goods, and not from private parties. For samples carried a complete written declaration must be executed by the agent, showing all the goods carried. The duty for the same must be deposited or proper security given for the amount. In case the samples are re-exported within three months after their entry the duty is refunded, on presentation of the customs receipt and the production of all samples originally included in the declaration. There is no local tax on samples in Servia.

Samples of wines are admitted free of duty when the capacity of the bottle does not exceed half a liter (1 pint), and if each bottle contains a different kind of wine from the others, and evidence is at hand that it is the bona fide intention of the agent to use the wine purely for sampling purposes.

SPAIN.

In Spain traveling agents who are supplied with proper trade licenses may solicit orders for goods with or without samples without payment of any additional tax; but they may not carry salable goods with them. Retail agents who travel about in the country are subject to the regular business tax, which is imposed, irrespective of the time when business is actually begun, for the entire fiscal year. A "patent," or receipt, is issued as evidence of the payment of the tax. Whether this tax need be paid at all and the amount, in case it is imposed, depends upon the following conditions: Those commercial agents who can produce receipts showing that they have paid a regular income tax for the house which they represent (contribucion sobre las utilidades de la riqueza mobiliaria), and who carry no samples other than those of the house they represent, are exempt from the business tax, in accordance with the Spanish industrial tax tariff of

August 2, 1900. Those agents who carry samples of precious stones, or of gold or silver watches, pay a tax of 190 pesetas ($36.67); while agents who solicit orders for goods of a different nature, or who buy grapes, cereals, or fruits for factories or merchants, pay a tax of 152 pesetas ($29.34).

Samples are admitted free of duty if they conform to the following regulations:

1. Samples of felt, tapestry, or woven goods must not exceed the length of 40 centimeters (16 inches), measured from the seam in case of woven goods and from the unprinted border on tapestry and felts.

2. Samples which do not possess such seams or borders may not exceed 40 centimeters (16 inches) in their total length.

3. Samples of passementerie of such small size as to possess no trade value and samples of wax cloth not exceeding 15 centimeters (5.9 inches) in their longest measurement are also free.

To prevent an abuse of these regulations a further provision requires that all samples be made worthless through incisions in their borders separated from each other by not more than 20 centimeters (8 inches).

The refundment of a duty paid upon imported samples is made in accordance with the following regulations:

1. Temporary entrance free of duty is accorded samples carried by agents who produce the prescribed trade license, and who personally accompany their samples. Furthermore, the samples must represent goods manufactured in a country which has concluded a commercial treaty with Spain or which has assented to reciprocity in trade.

2. In order that the agent may enjoy a refundment of the duty upon his samples, entry of the same must have been made over one or the other of the following ports, and the reexportation must also be made over one of these ports: Alicante, Almeria, Barcelona, Badajoz, Bilbao, Cadiz, Canfranc, Cartagena, Corunna, Fregeneda, Fuentes de Onoro, Gijon, Grao de Valencia, Huelva, Irun, Malaga, Palma de Majorca, Port Bou, San Sebastian, Santander, Seville, Tarragona, Tuy, Valencia de Alcantara, and Vigo.

3. In the presentation of samples for the purpose of entry, agents are required to prepare a full declaration similar to that prescribed for the importation of salable goods, and append to the same the date and place of the issuance of the trade license.

4. The Spanish customs authorities make entry of samples in a manner similar to that employed in the entry of salable goods. The samples are, however, also supplied with distinguishing labels. After the deposit of the duty a pass "guia" is issued which is good for the period of one year.

5. The entry of samples need not be personally supervised by commercial agents. They may empower merchants or transportation agents to tend to the entry for them by supplying them with their trade license, or business passport, as evidence of their identity.

6. When the reexportation of samples is made over the original port of entry the refundment of the deposited duty can be obtained at once. If reexportation is made over some other port refundment can be made only after the communication

of the customs officials of the two ports and a comparison of the samples entered and reexported.

7. When only part of the samples entered are reexported, refundment of the deposited duty takes place only for such part, the full duty being paid for those samples retained.

In this respect the Spanish regulations differ from those of other countries already enumerated, which prescribe that where the reexportation of only part of the imported samples is made duty must be paid upon the entire lot. After the lapse of the interim of one year without the reexportation of the sample the right of refundment is extinguished.

Samples of wines may be imported free of duty provided the capacity of the bottles does not exceed 5 deciliters (1 pint) and their contents are dissimilar.

The Spanish postal regulations are stringently enforced against foreign mail containing samples. Where dutiable samples are found in the mails the recipient is given the choice of returning the same to the sender or of paying a penalty of from five to ten times the regular duty on the samples. If such samples are sent per package post they are taken in charge by the Spanish railroads at the boundary, and after appraisement and entry are forwarded as freight to their destination. This invariably occasions a serious delay in their transportation. In consideration of this fact the Spanish postal authorities are reported to be willing to receive samples per letter post provided proper declaration of same is made and their nature as samples is assured.

SWEDEN.

In Sweden the traveling agent is required to apply for a trade license, which is good for thirty days and costs 100 crowns ($26.80). This license must be obtained before he may begin business, and is issued by the mayor of a city, by a city treasurer, or by a police commissioner. In the country a so-called "laensman," a communal treasurer, or a certain church officer has this function in charge. In case arrest follows the transaction of business conducted without the possession of the trade license the party is liable to a fine of from 100 to 500 crowns ($26.80 to $134), in addition to the payment of the regular trade tax of 100 crowns. It is reported that the preceding provisions are very strictly enforced, so that their scrupulous observance by traveling agents is recommended.

When entry of samples is made these should be supplied with identifying labels and properly registered. Upon request the agent will be supplied with a copy of such registration. The duty must be paid in cash, but is refunded in case the reexportation of all the samples entered follows.

SWITZERLAND.

In Switzerland traveling agents are free of all trade taxes if the solicitation of orders is confined entirely to merchants who handle the goods dealt in. They must also produce a trade license executed in the country in which the firm represented is located, showing that said firm is duly registered and qualified to do business. If the agent desires to solicit orders from any and all persons he is required to pay a tax of 150 francs ($28.95) per year and 100 francs ($19.30) per half year.

Commercial agents who wish to avail themselves of exemption from taxation are not allowed to carry samples. Exception can, however, be made in case of the solicitation of orders for goods which are generally bought on the spot, as diamonds or other precious stones. Special permission must in any event be obtained before doing business. No such permission can be obtained for the carrying of a series of goods—as for an entire branch of business—as dress goods, watches, and jewelry in general. The articles which it is desired to carry must all be specifically enumerated and be few in number.

Agents must also provide themselves with an "Ausweiskarte," or identification card, or business passport, which is issued in the first Canton reached by the agent. Those representatives who are exempt from taxation in accordance with the aforenamed regulations are not obliged to pay a fee for the issuance of the identification card, while those who conduct their business in such a manner as to be subjest to a tax can obtain such card only on the payment of a prescribed fee.

Samples are admitted free of duty if proper security is given for their reexportation within the prescribed time and the identity of the goods is satisfactory at the time of their reexportation. For the establishment of the identity of samples, the common usage of attaching labels and officially registering the goods at the port of entry is in vogue.

TURKEY.

In Turkey commercial agents are exempt from taxation. Samples are subject to a duty of 8 per cent of their market value. Where samples are reexported within six months after their entry the duty paid upon them is refunded to the amount of 7 per cent of their market value, leaving 1 per cent of their value to cover the expenses of tariff administration.

Trade with the Orient and Levant is always accompanied by great dangers and risks. Experience has shown that only powerful firms, with a large capitalization, can successfully cope with the difficulties of Eastern trade. Only such firms can afford to give long credits and bear occasional losses. Losses will be suffered time and time again, and only the firm that can hold out and balance losses with considerable gains in the course of long periods of trade can hope to win. It is necessary that gains be large in this trade. Certain German firms dealing with the East have found that a gross profit of 15 per cent must be realized if a profitable business is to be done. The only safe way of making sales in this part of the world is through agents whose business integrity is beyond question. German consular representatives are reported to have been instrumental in obtaining reliable agents for German exporters in numerous instances.

AMERICA.

ARGENTINE REPUBLIC.

Traveling agents who wish to do business in the Argentine Republic must apply for a special trade license or patent in every Province they reach. The capital, Buenos Ayres, is said to be the only place where business may be done without such special trade license. It matters not whether the agent presents samples only and solicits orders on the strength of them, or whether he also carries salable goods with him. The special license must be applied for in any event. The fee for issuing the license varies with the nature of the trade, and ranges from 50 to 250 paper pesos (from $37.50 to $187.50, on the basis of 75 cents to a peso) per year. For the conduct of a permanent business in the Argentine Republic the taxes are still higher. The shortest time for which a trade license is issued is one year. Personal application for same must be made. A violation of these regulations is punishable with a fine of 50 per cent of the tax to which the agent is subject, in addition to the payment of the full amount of the tax.

Samples without commercial value are admitted free of duty. Samples possessing a market value can only be entered after the deposit of the regular duty on the goods. If their reexportation takes place within the stipulated time limit of from one to six months the duty is refunded; otherwise the right of refundment expires.

Dutiable goods sent through the mails as registered letters are generally confiscated if discovered.

BRAZIL.

In Brazil commercial agents are exempt from all Government taxes if they can prove themselves to be representatives of a firm which is domiciled in the country and which pays a regular tax. They may, however, be subjected to a municipal tax by any of the provincial states in which they travel. This municipal tax is said to amount to 100 milreis ($54.60) in Rio de Janeiro, but its collection does not seem to be strictly enforced. In Pernambuco this tax is 200 milreis ($109.20); in Ceara, 270 milreis ($147.42); in Bahia, 1,000 milreis ($546); in Para, 1,000 milreis, ($546); in Amazonas, 300 milreis ($63.80); in Maranhão, 200 milreis ($109.20); in Rio Grande and Polotas, 500 milreis ($273); in Porto Alegre, 1,000 milreis ($546). In Bahia this tax must be paid as soon as the boundary is crossed.

Samples are dutiable, and it seems that no refundment is made even in case of their reexportation. While samples without a market value, or with but a slight value, are, according to the regulations, free of duty, this provision is reported to be of little importance in practice.

CANADA.

In Canada traveling agents are subject to a trade tax only on Prince Edward Island, where they are required to pay $15 per year.

Samples are dutiable, and, in distinction from the custom common to many other countries, refundment of the duty does not follow the reexportation of the samples upon which duty was originally paid.

CHILE.

In Chile commercial agents are free in the transaction of their business. They are exempt from all taxation and need produce no trade license. Samples of goods on which the duty is less than 2 pesos (73 cents) are admitted free of duty. All other goods and samples are subject to the regular duty.

COLOMBIA.

As in Chile, the traveling agent who crosses the frontiers of Colombia does not require a trade license and has no taxes to pay. Samples are free up to the weight of 25 kilograms (55 pounds) gross weight. For quantities of samples beyond this amount the regular duty must be paid. A respite of twelve months is given for the reexportation of dutiable samples. Where this time limit is observed the refundment of all duties paid upon the samples on their entry takes place. Extensions of the time limit, which it seems were frequently granted in the past, are no longer permissible.

JAMAICA.

In Jamaica the trade tax of £22 10s. ($109.49) for trade in spiritous liquors and £12 10s. ($60.83) for trade in other commodities, which was formerly imposed on traveling agents, has been removed, so that agents are now free to conduct their business. Samples from the appearance and character of which it is manifest they are not intended for sale and that they possess no market value are admitted free of duty. If, on the other hand, the samples appear to have a marketable character they are subjected to the regular duty. This duty must either be paid in cash against a custom-house receipt or security given in the form of a deposit equal to the amount of the duty. If on leaving the country the agent carries his samples with him the amount deposited is refunded or the duty regularly paid against a receipt repaid by the observance of prescribed formalities.

MEXICO.

In Mexico, as was found to be the case in Buenos Ayres, traveling agents who confine their activity to the City of Mexico, or the surrounding Federal District, are free of all taxes. In the interior of the country the tax imposed varies in accordance with the number of commodities handled by the agent. After the payment of this tax the agent is free to conduct business with merchants as well as with private individuals. Samples possessing a value are subject to the regular duty, but when a declaration is made by the agent in importing them to the effect that it is his intention to reexport them within a certain time, the duty is refunded if such reexportation is made within the declared time.

PARAGUAY.

In Paraguay commercial agents pay a tax which varies in accordance with the class in which they are registered, and may be 1,000, 600, or 400 pesos* ($80, $48, or $32) for every six months, and must be paid at the beginning of each calendar half year. If the agent arrives after the beginning of the half year the tax is reduced in proportion to the time that has passed since the 31st of January or the 31st of July. It is well to bear in mind that the above tax is levied for the city of Asuncion only, and further taxes are imposed by the authorities of other cities visited by the agent. However, it is reported that in practice the cities of Paraguay do not exercise this right as a general rule. The tax receipt must be preserved by the agent, as he may at any moment be approached by police or other authorities and asked to produce evidence of his right to transact business.

Samples without value are admitted free of duty; if they possess a market value the regular duty must be deposited for the time being. If the samples are reexported within the prescribed time, the length of which could not be ascertained, the duty deposited is refunded.

PERU.

In Peru traveling agents are free to transact business. They are exempt from all taxes and need not produce a trade license or other papers. Samples without value are free of duty. All others are subject to the regular duty.

SALVADOR.

In Salvador commercial agents are not subject to any trade taxes, nor are they required to be in possession of a trade license or other documents. Samples are subject to the regular duty, which must be deposited with the customs authorities on the entry of the goods, but which is refunded on the reexportation of the samples.

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*The latest estimate of the value of the paper peso places it at about 8 cents United States currency.

URUGUAY.

In Uruguay the industrial tax law of October 30, 1901, determines the taxes for commercial agents traveling in the country. The most important regulations contained in this law are condensed below.

Fixed taxes for those who conduct trades in different commodities are grouped under seven categories, with amounts of about 100 pesos ($103.40) each for the period of one year. Receipts are issued after the payment of the tax, which are good for the period of one calendar year. If an agent enters the country between July 1 and September 30 of any year he is required to pay but one-half of the amount of the annual tax. If he enters after October 1 he pays but one-fourth of the amount of the annual tax. A violation of these regulations is punished with a money fine of 10 pesos ($10.34) on the first offense and 20 pesos ($20.68) on renewed offenses.

Legal action in industrial-tax cases lies within the jurisdiction of the justice of the peace of the locality in which the person liable to an alleged tax resides. The proceedings in such cases are said to be summary.

Tax receipts are issued in the name of the person paying and are nontransferable where business is done at a fixed residence. In case of traveling agents who move from city to city the receipts lose their personal character and are considered the property and proof of the possessor. If the possessor of a tax receipt loses the same he can, in case he has a fixed residence, apply for a certification from the tax authorities that he has paid the same, if sufficient proof is at hand to support his claim. This does not hold good in case of tax receipts which are the assumed property of the possessor. When once lost these can not be replaced. The tax receipt must be continually carried on the person of the one doing business. Everybody must voluntarily report to the proper authorities his presence in the country and his liability to the payment of a trade tax.

For the district of Montevideo a special law puts in operation certain regulations which differ from those given above. The usual tax of 100 pesos ($103.34) per year must be paid by the agent, no matter how far the calendar year may be advanced, on his arrival in the country.

Samples which from their character and appearance plainly show that they are not intended for sale are admitted free of duty. Larger quantities of samples of the same general class of goods, even though of different qualities, are subjected to the regular duty.

Contrary to the practice which is common in most countries no refundment of duty takes place on the reexportation of the samples. No agent is permitted to have identifying labels fastened to his samples in anticipation of having the duty refunded on their reexportation. A duty once paid on samples is absolute and can not be recovered.

ASIA.

BRITISH INDIA.

In India traveling agents require no trade license for the conduct of their business, nor are they subject to any trade tax. They must, however, pay an income tax if their incomes exceed the sum of 500 rupees (about $162). On the importation of samples the duty on the same must be deposited; if reexported, the duty deposited is refunded to the extent of seven-eighths of the amount deposited.

CEYLON.

In Ceylon commercial agents are subject neither to trade taxes nor fees, nor need they produce any trade license or passport. Samples devoid of commercial value are admitted free of duty. Samples possessing a market value are temporarily admitted free of duty if some reputable and reliable firm vouches for their reexportation.

CHINA.

In China traveling agents are not obliged to produce a trade license when business is confined to the treaty ports. It is reported to be customary to notify the consulate on arrival. If the agent desires to visit the interior, he must secure a regular Chinese passport. Samples without value are admitted free of duty; if they possess commercial value, the regular duty must be paid.

JAPAN.

In Japan commercial agents are exempt from all taxation as business agents. Their samples are admitted free of duty if all the prescribed customs formalities are observed and a deposit made as guaranty for the reexportation of the samples within the time fixed by the customs regulation.

PERSIA.

In Persia, also, the traveling agent is free from all taxes. He must, however, be in possession of a passport which has been properly visaed by the representative of the Persian Government who resides in the country in which the agent has his permanent residence. Thus, an American agent is required to produce a passport which has been visaed by the Persian representative at Washington. Probably a Persian consul in the United States could also perform this duty, but the writer is in doubt as to whether the Persian Government has conferred this power upon its consular representatives.

Samples without market values are admitted free of duty. All those which possess a commercial value, as shown by the appearance and general character of the goods, are subject to duty. Textiles whose length and breadth exceeds 30 centimeters (11.81 inches) must pay duty. All woven goods of smaller size are entered free.

SIAM.

Commercial agents traveling in Siam are free from all taxes and other fees. It is, however, considered advisable to carry a passport.

Samples are admitted free of duty under observance of certain formalities. It seems that all kinds of samples, irrespective of size and quality, are entered free. On their reexportation certain customs regulations must also be observed.

STRAITS SETTLEMENTS.

It is reported from the Straits Settlements that no regulations exist governing the activity of commercial agents. Nor are there any customs laws regulating the entrance and reexportation of samples of any kind.

COMMERCIAL REPRESENTATIVES FOR THE ORIENT.

It is probably not a very difficult task to find German manufacturers who are not enthusiastic about the oriental trade for the reason that they have, at one time or other, suffered losses through being made victims of unscrupulous eastern agents who wheedled them into business transactions by misrepresentations and chicanery. Sometimes, probably, the real blame must be attached to the manufacturer for having permitted himself to be an easy mark and for not inquiring into the standing and reputation of the man with whom he was to deal. Yet it must be conceded, in view of the past experience of exporters who have done business with the East, that the choice of reliable commercial representatives is by no means an easy undertaking. The necessity of having a trade representative in the Orient can not be questioned. Even in cases where business is done directly with firms, it is said to be advisable to employ a representative at the same time. There are a thousand and one things which require attention and which can not be properly attended to by long-distance correspondence.

In a recent article in the Austro-Hungarian Export Review, the question of the selection of commercial representatives for the Orient is dwelt upon and many valuable suggestions given for the exporter interested in the eastern trade.*

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*The term "Orient" is generally used in German papers in a narrow sense, as confined to the immediate East or the Levant, though the points here brought out apply equally well to the far East.

Just what sort of a representative it may be politic for a European firm to engage depends largely upon the nature of the goods in which business is to be done. If a business is to be conducted upon a wholesale plan it is wisest to attempt to engage a "big representative," who has been in the business for a long time and can show unmistakable proof of honesty and business integrity. Generally it is difficult to engage such firms, because very frequently they are already in the service of some prominent competitor who came first upon the field. Then also they are, as a rule, crowded with work, as men with unblemished reputations who are capable of running a large wholesale business in the Orient for a European exporter are rare and can not be picked up every day. But it is said that though these big representatives may be reluctant to undertake any more European business, if they can be prevailed upon to do so great confidence may be placed in the results. Business may pick up but slowly at first, but there is no need to worry about the execution of contracts.

In case of articles which are to be pushed in the markets upon a small scale, and mainly in the retail trade, the engagement of some smaller representative is said to be advisable. It is especially in such cases that great circumspection is necessary in making a choice. While it may be comparatively easy to choose a reliable agent among the largest firms of the place, this is not the case where smaller firms are under consideration. Many of these have been upon the blacklist for years, yet manage to cover up their tracks so shrewdly that the unsuspecting are easy prey, and even the most circumspect tread on dangerous ground. If great care is taken one may find a firm of young men who are reliable, enterprising, and energetic.

These facts, as they are disclosed in the Export Review already referred to, ought to be sufficiently plain to show that oriental representatives can not wisely be engaged through the mails and without the most scrutinizing investigation. To strike a choice among those who offer themselves through correspondence is the height of folly, unless they are in a position to produce indisputable evidence of their responsibility and integrity, preferably guaranteed by some well-known and prominent eastern firm which has consented to act as a sort of protector.

Under date of August 18, 1903, I submitted a report upon the opportunities for exporting American hosiery to the Orient by way of Germany,* and called attention to the intelligence of the oriental buyer in matters pertaining to his business and the thoroughness of his knowledge of textiles and textile prices. The eastern buyer is known to possess unusual natural keenness and business ability, and where he combines with this a bent to trickery and sharp practice he becomes a dangerous man to deal with through long-distance correspondence. For this reason the facts here presented can not be too seriously taken to heart by American exporters to the East who are new in the field and who desire to shield themselves from loss.

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*See DAILY CONSULAR REPORTS No. 1758 (September 25, 1903).

AFRICA.

ALGERIA.

Commercial agents are exempt from all taxation in Algeria. They must, however, prove their identity by means of trade licenses. Samples can not be entered without payment of the regular duty. On their reexportation the amount deposited is refunded. The foreign trade of Algeria is largely in the hands of France, but Germany has been enjoying a wider market, so it is reported, since the Paris World's Exposition.

BRITISH SOUTH AFRICA.

CAPE COLONY.

Traveling agents who do business in Cape Colony must apply for a trade license, which costs $121.66. This license expires on December 31, irrespective of the time of its issuance. If it is applied for after July 1, the fee connected with it is reduced by one-half. If the firm doing business sends a trade representative the license is made out to him and in his name as agent for the firm, and a transfer of the license is not permissible. A refund of part of the tax because of nonuse of the license for the entire time for which it is valid is not granted.

The duty on samples must be paid on their importation, but, as is customary in most countries, the same is refunded on the reexportation of the samples.

The railroads of Cape Colony grant preferential rates to commercial agents and their sample cases.

NATAL.

In Natal traveling agents are required to apply for a trade license, which costs $48.66. Every license expires on December 31, no matter when issued. If application is made for a license after the 1st of July of any year the cost of issuance is but $29.20.

Samples without market value are admitted free of duty. If they possess a market value the duty must be deposited, but is refunded on the reexportation of the samples.

ORANGE RIVER COLONY.

In the Orange River Colony trade licenses are issued to traveling agents for three months at a cost of $24.33. If the agent is traveling for a liquor dealer and is soliciting orders for the firm, he has to pay $97.33 for the same period.

TRANSVAAL.

In the Transvaal the fee for a trade license is $97.33 if it is to run for the entire year, and $48.66 for six months. Samples possessing no market value are admitted upon deposit of the duty. The amount deposited is, however, refunded on the reexportation of such samples. Samples subject to duty and possessing a commercial value can not be imported without previously paying the duty.

EGYPT.

In Egypt traveling agents are not subject to any particular fees or taxes, and require no trade license. Samples which possess no market value, and which show evidence that they are not intended for sale, are admitted free of duty, if proper guaranty is given for their reexportation within six months. This time limit may, on request, be extended to one year.

The commercial agent who desires to do business in the Sudan must apply for a passport from the Sudan government, without which he is not permitted to travel in the country. For the issuance of this passport it is necessary for the agent to appear personally before a representative of the Sudan government at Cairo, Halfa, or Suakim and produce a letter of indorsement, or identification, issued by the consular representative of the agent's country or by some person well known in the Sudan.

MOROCCO.

In Morocco commercial agents are exempt from all taxes and fees and are not required to produce a trade license or other identifying papers. Samples which are carried in cases not exceeding "ordinary traveling baggage" in size—so the reports put it—are, "as a rule," admitted free of duty. In certain cases, the nature of which could not be ascertained, they are subject to an ad valorem duty of 10 per cent. The agent need not count on the refund of duty, once it is paid.

TUNIS.

As in the case of Morocco, traveling agents are not subject to any taxes or fees and require no trade licenses or other papers of identification. The duty on samples must be deposited on the importation of the samples, but is refunded if the reexportation takes place within the period of six months. No refund is made in case of the duty deposited for samples of food stuffs, or "edibles."

ZANZIBAR.

In Zanzibar traveling agents are exempt from all taxes and fees. The carrying of a passport is said to be advisable. Samples are free of duty.

AUSTRALASIA.

NEW SOUTH WALES.

Commercial agents are not required to produce any trade license or identification papers. Where samples are carried which from their size and general make it is plain that no intention exists to place them upon the market, they are entered free of duty. In other cases the regular duty must be paid. There does not appear to be any provision for the refundment of the duty in cases where the samples are reexported.

NEW ZEALAND.

In New Zealand commercial agents who solicit orders can enter free from all restrictions, taxes, or fees. They must, however, notify the customs authorities of their arrival and register themselves before beginning their business. On leaving the country every agent must report to the customs authorities with whom he originally registered. He is then required to give a sworn statement of the amount of his orders taken. This having been done he has to pay an income tax as follows: The profit on his orders is calculated to amount to 5 per cent of the aggregate amount of the orders taken, and the agent is then taxed on this income to the extent of 5 per cent. The income tax must be paid prior to the agent's departure from the country.

All agents who wish to solicit orders from private individuals in their homes must also possess a trade license, which costs £1 or £2 ($4.87 or $9.74), according to the size and importance of the cities visited in the course of business.

No regulations requiring a special passport or other identification card exist. Samples are admitted upon deposit of the duty to which they are subject, with the privilege of having such deposit refunded in case of their reexportation within a prescribed time. The intention to reexport the same must have been declared on the entry of the samples.

QUEENSLAND.

No taxes, licenses, fees, or other dues are exacted from commercial agents in Queensland. Samples are subject to duty when they possess a market value. If such duty exceeds the sum of £2 ($9.73) the same is refunded on the reexportation of the samples, provided all the samples which were originally entered are reexported. If any of them have been sold or disposed of in any way the right of refundment is lost. For certain commodities, such as supplies for vessels, grain, tobacco, liquors, wines, beer, and jewelry, no refundment is made under any circumstances. Samples without any market value are admitted free of duty.

SOUTH AUSTRALIA.

Traveling agents are free from all taxes and fees, and need not take out a trade license. Samples of all kinds which possess a market value are subject to duty, which is, in certain cases, refunded on the reexportation of the goods. Samples of dutiable goods which consist purely of cuttings are admitted free.

TASMANIA.

Except for wholesale trade in wines and liquors, for which a license of £25 ($121.66) must be taken out, commercial agents are not subject to any tax in Tasmania. Samples without market value are admitted free of duty. Those which possess a commercial value must pay the regular duty. No refundment of duty takes place, as is so commonly customary.

VICTORIA.

Traveling agents are free from all taxation. They are not required to be in possession of a trade license, and may solicit orders for all kinds of goods and from all kinds of individuals. Samples without a market value are free of duty. Those which possess a commercial value are admitted upon deposit of the amount of the duty. They are properly labeled in this case, and in the event of their reexportation the duty is refunded. When once entered the samples can be carried through the country free from all other restrictions.

WEST AUSTRALIA.

Traveling agents are not obliged to pay any license fees or other taxes. Samples carried which possess a market value are subject to the regular duty. On their entry a certified list must be executed showing all the samples carried. If within the limit of two months such samples are reexported the duty upon the same is refunded, provided the aggregate value of the samples which were originally entered exceeded £50 ($243.32). No refundment of duty takes place where the total value of the samples is less than this amount, no matter when they are reexported. The identification of the samples must be out of the question, and generally the original form of packing must have been adhered to. The duty on jewelry and watches must either be paid at once on the entry of the articles, or they must remain under the control of the customs officials.

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VALUES OF FOREIGN COINS AND CURRENCIES.

The following statements show the valuation of foreign coins (not including rates of exchange), as given by the Director of the United States Mint and published by the Secretary of the Treasury:

COUNTRIES WITH FIXED CURRENCIES.

Country.	Standard.	Monetary unit.	Value in U.S. gold.	Coins.
Argentine Republic	Gold and silver	Peso	$0.96,5	Gold—argentine ($4.82,4) and ½ argentine; silver—peso and divisions.
Austria-Hungary	Gold	Crown	.20,3	Gold—20 crowns ($4.05,2) and 10 crowns.
Belgium	Gold and silver	Franc	.19,3	Gold—10 and 20 franc pieces; silver—5 francs.
Brazil	Gold	Milreis	.54,6	Gold—5, 10, and 20 milreis; silver—½, 1, and 2 milreis.
British N. A. (except Newfoundland).	do	Dollar	1.00	
British Honduras	do	do	1.00	
Chile	do	Peso	.36,5	Gold—escudo ($1.825), doubloon ($3.65), and condor ($7.30); silver—peso and divisions.
Costa Rica	do	Colon	.46,5	Gold—2, 5, 10, and 20 colons; silver—5, 10, 25, and 50 centisimos.
Cuba	Gold and silver	Peso	.92,6	Gold—doubloon ($5.01,7); silver—peso (60 cents).
Denmark	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Ecuador	do	Sucre	.48,7	Gold—10 sucres ($4.8665); silver—sucre and divisions.
Egypt	do	Pound (100 piasters).	4.94,3	Gold—10, 20, 50, and 100 piasters; silver—1, 2, 10, and 20 piasters.
Finland	do	Mark	.19,3	Gold—10 and 20 marks ($1.93 and $3.85,9).
France	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Germany	Gold	Mark	.23,8	Gold—5, 10, and 20 marks.
Great Britain	do	Pound sterling	4.86,6½	Gold—sovereign (pound sterling) and half sovereign.
Greece	Gold and silver	Drachma	.19,3	Gold—5, 10, 20, 50, and 100 drachmas; silver—5 drachmas.
Haiti	do	Gourde	.96,5	Silver—gourde.
India	Gold	Rupee	.32,4	Gold—sovereign ($4.8665); silver—rupee and divisions.
Italy	Gold and silver	Lira	.19,3	Gold—5, 10, 20, 50, and 100 lire; silver—5 lire.
Japan	Gold	Yen	.49,8	Gold—1, 2, 5, 10, and 20 yen.
Liberia	do	Dollar	1.00	
Netherlands	Gold and silver	Florin	.40,2	Gold—10 florins; silver—½, 1, and 2½ florins.
Newfoundland	Gold	Dollar	1.01,4	Gold—$2 ($2.02,7).
Peru	do	Sol	.48,7	Gold—libra ($4.8665); silver—sol and divisions.
Portugal	do	Milreis	1.08	Gold—1, 2, 5, and 10 milreis.
Russia	do	Ruble	.51,5	Gold—imperial ($7.718) and ½ imperial ($3.86); silver—¼, ½, and 1 ruble.
Spain	Gold and silver	Peseta	.19,3	Gold—25 pesetas; silver—5 pesetas.
Sweden and Norway	Gold	Crown	.26,8	Gold—10 and 20 crowns.
Switzerland	Gold and silver	Franc	.19,3	Gold—5, 10, 20, 50, and 100 francs; silver—5 francs.
Turkey	Gold	Piaster	.04,4	Gold—25, 50, 100, 250, and 500 piasters.
Uruguay	do	Peso	1.03,4	Gold—peso; silver—peso and divisions.
Venezuela	Gold and silver	Bolivar	.19,3	Gold—5, 10, 20, 50, and 100 bolivars; silver—5 bolivars.

COUNTRIES WITH FLUCTUATING CURRENCIES.

Country and monetary unit.	Jan. 1, 1903.	Apr. 1, 1903.	July 1, 1903.	Oct. 1, 1903.	Country and monetary unit.	Jan. 1, 1903.	April 1, 1903.	July 1, 1903.	Oct. 1, 1903.
Bolivia:	*Cts.*	*Cts.*	*Cts.*	*Cts.*	China—Continued.	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Silver boliviano	36.1	35.2	38.4	40.8	Ningpo tael	56.1	54.8	58.3	63.4
Central America:					Niuchwang tael	53.3	53.4	59.8	64.8
Silver peso	36.1	35.2	38.4	40.8	Peking tael	....	....	....	64.3
China:					Shanghai tael	53.2	52	56.8	60.2
Amoy tael	58.4	57	62.2	65.9	Swatow tael	54.2	52.6	57.5	60.9
Canton tael	58.2	56.8	62	65.7	Takao tael	59.6	57.3	62.6	66.3
Chefoo tael	55.8	54.5	59.5	63	Tientsin tael	60.1	55.9	60.5	63.9
Chinkiang tael	57	55.7	60.7	64.4	Colombia:				
Fuchau tael	54	52.7	57.5	61	Silver peso	36.1	35.2	38.4	40.8
Haikwan tael	59.4	58	63.3	67.1	Mexico:				
Hankau tael	54.6	53.3	58.2	61.7	Silver dollar	39.1	38.3	41.8	44.3
Hongkong tael	(*)	(*)	(*)	(*)	Persia:				
Nankin tael	....	....	....	65.2	Silver kran	6.6	6.5	7.1	7.5

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* The "British dollar" has the same legal value as the Mexican dollar in Hongkong, the Straits Settlements, and Labuan.

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